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On the Fracture of Steel Rails.*

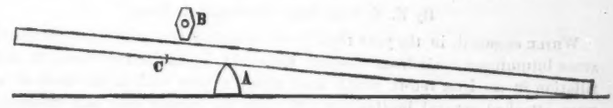
PROFESSOR EGLESTON gave an account of experiments made by him in France, in 1873, to determine the causes of fracture of steel rails. The rails examined were broken in the track during the Spring of 1873. The fracture was examined, and circumstances of breaking recorded. The contract stipulates that the rails shall resist a certain weight falling from a given distance, and prescribes the amount of permanent flexure the rails may have under this test. The broken rails were tested by placing them on supports one metre apart, and allowing a weight of 300 kilo. to fall 3½ metres. In no case did the broken rail break under this test. The causes of fracture were ascertained to be defect in manufacture, from large blow-holes in the steel, careless handling on the part of the men, as allowing a rail to fall, producing an invisible fracture, or from punching or notching the rails. It is difficult to ascertain how often the breakage is due to the first two causes, as a rail rarely arrives at the engineer's office with a fresh fracture; but since punching and nicking have been forbidden, it has been found that the larger part of the rails break within six months of the time they are laid down—the great majority within six weeks; the greater part of those remaining after this time breaking from ordinary accidents.

The broken pieces are always tested, and almost invariably stand the test prescribed. With regard to punching, it was found to be absolutely disastrous, more than 50 per cent. of such rails, either punched or nicked, breaking on the road-bed within a comparatively short time, and always heading the list.

The life of a steel rail is ascertained by taking a plaster cast of it before it is laid, and again after it has been some time in the track, and comparing the two. As the results of a great number of experiments, it was found that a steel rail of good quality wears uniformly at a rate of a millimetre for 20,000,000 of tons traffic, while an iron rail of the best quality is used up after a traffic of 14,000,000 to 20,000,000 of tons. An effort was made to collect statistics with regard to the cause of the fracture of rails in Winter, which seemed to show that the excess in the number of fractures was due quite as much, if not more than to any other cause, to the rigidity of the road-bed during the Winter months. The experiments are not yet completed. The analyses of the rails are yet to be made, and a certain number of microscopic and physical experiments for which specimens of each rail broken have been preserved. The experiments were made at the shops of the Chemin de Fer du Nord, the company not only giving the use of their shops, but the facility for examining all their records. The Orleans and Lyons Railroads also allowed all their records to be examined. A full report of the whole investigation will be given later. Grateful acknowledgments are due to M. COUCHE, chief engineer, and also to M. COUTAMIN, one of his assistants, under whose immediate superintendence the work was done.

Mr. JOHN FRITZ remarked that the fracture of steel rails was referable either to abnormal chemical composition, or improper mechanical treatment. Often we have in the chemical composition alone a sufficient cause for breakage. It is known that where the amount of carbon is high, the amount of silicon and phosphorus must be low. He had, for instance, examined two foreign rails of the same make, which broke in the track. One contained 0.16 per cent. carbon, 0.087 silicon, and 0.127 phosphorus; the other 0.58 carbon, 0.56 silicon, and 0.112 phosphorus. They were both forged out to small bars, and while the first could be bent double cold, the last broke at the first attempt to bend it. But more important, if possible, than the chemical composition is the mechanical treatment. All violent disturbance of the molecular arrangement of the particles of the steel when cold, as in straightening, punching, notching, etc., tends to make it brittle. SANDBERG has shown that hard steel rails which were notched on the flange suffered a loss of strength of 50 to 97 per cent.—the former where the notch was semi-circular, and the latter when the notch was square. At the Bethlehem Iron Works, a sample ingot is taken from each blow forged out to a bar about ¾ by 1 in., and bent until the ends meet. From this ingot samples are also taken for analysis. A rail from each heat is further subjected to a drop test of 2000 lb. falling fifteen feet. When the rail is notched, or punched, it will sometimes break with a drop of one foot. The question naturally arises, why expend so much care on making a rail that will stand the fifteen feet drop and then deliberately reduce the strength 90 per cent. or more at each end? The advantage in favor of drilling over punching is very marked. Where a punched rail will break with a drop of one to two feet, a drilled rail will stand eight to ten. Not long since, an engine on the Lehigh Valley Railroad ran off the track and struck a number of steel rails on the sides, or flanges. All of these rails broke shortly after in the track. With regard to iron rails, it is simply a matter of good iron and of dollars and cents. There is no mystery here, and it isn't worth discussion.

Mr. W. A. SWEET, of Syracuse, said:—While I am neither a manufacturer of steel rails, nor a user of them, my experience as a manipulator of rail-ends and old rails has given me great and varied experience in the breaking of rails, and has led me to conclusions perhaps different from any one present, and, it may be, from any one in existence. Not having shears sufficiently strong to cut a steel rail, it has been a study with me to find a way to break old steel rails with the least physical labor, as I think I am naturally lazy, and try to do with head-work what some others do with their hands. I find, by arranging the rail as shown in the accompanying sketch, where A represents the point of support, B the



sledge, and C the position of the nick in the flange, the rail is almost invariably broken at the first blow. There is a perceptible time, after striking the blow, before the suspended end drops off, appearing as if a wave of vibration passed to the end, and back again to the point where the flange is cut, where it seems to stop suddenly, the wave of vibration appearing to me to be arrested and concentrated to that extent that the molecular constitution of the metal is destroyed. It may be, however, that the vibrations do not go to the end and return, but are arrested in the first instance at the point where the nick or dent is made. That it is a wave of vibration that causes breaking in steel rails, I am fully convinced. I do not think that the cutting or punching of the holes for the fish-plate bolts would weaken the rail beyond what would be produced by the removal of so much metal, provided that the rails have been rolled at the proper temperature when finished. But where the ends are allowed to get loose, my opinion is that they break at the remote end, after the passage of the last wheel of the train.

I think if a rail is actually tight in the fish-plate (and but few are), there will be no breakage without the cause is on the face of it, as by the running off of the cars, or some actual duty too great for their strength to bear.

It is well known that bells are supposed to be made the proper shape to throw off vibration, and to continue to do it for years without breaking. When one is not so proportioned it soon breaks, and must be replaced by a new one, and no credit accrues to the maker of the faulty one.

In the case of a rail, we have a bar equal in size from end to end, and it only wants a mark or dent with a hammer to arrest the waves a few times, and the result is a break. The now accepted fact, that punching the holes for the fish-plate bolts weakens the rail 75 per cent., shows, to a thinking mind, that there is something wrong, either in the molecular construction of the metal itself, or in its manipulation.

I claim, and have for years, that it is in the *manipulation*; that steel rails have not yet been rolled properly, or finished at a proper heat. They should be rolled and finished in chilled rolls, with finished passes, and at a heat that will just set the scale. Having rolled thousands of tons of rail-ends into small bars, and so treated them that they will bend double and stand pounding down flat, I feel prepared to say that, if rails were rolled as we roll tire steel, they would stand ten times the shock they now will, and that punching the holes would weaken them only in proportion to the amount of metal removed.

We are taking Bessemer steel and converting it into blister steel by the cementing process (imparting to it enough carbon, so that by analysis it shows 1 per cent.), rolling it into spring steel, and from it making hundreds of pairs of springs per day. The leaves of the same are 1¼ inches wide, with three holes 5-16 inches in diameter punched in each one, and when they are tested they do not break in the holes. There are many thousands of our tire for carriages, where the bolt-hole is more than ¼ the width of the tire, and a tire from this stock is scarcely ever broken. The tire is strained on the wheel in setting, as is well known, and receives many blows from contact with the pavements, fully

* Remarks made by Prof. T. EGLESTON, and others, at the St. Louis meeting of the American Institute of Mining Engineers.

equal to what rails are subjected to, and probably much more in proportion to the actual weight of its section.

Dr. T. M. DROWN did not see upon what the assumption was based that a hard road-bed was the principal cause of breakage of rails in cold weather. It may facilitate the breakage, but there is certainly enough experimental evidence to prove that, while iron and steel may exhibit an increased tensile strength at low temperatures, where the strain is gradually applied, they are at the same time rendered brittle, and are liable to break. SANDBERG's experiments are conclusive on this point for iron rails, and, *à priori*, the difference in temperature must be more marked in the case of steel.

Other members mentioned irregularities of road-bed and the flattening of wheels as the cause of fracture. Mr. SPILSBURY remarked that in Belgium 85 per cent. of the breakages were referred to defective track-laying.

Note.—Since making the above remarks at St. Louis, I have had some experiments tried, and I am still at work to find the cause of the peculiar quality of Bessemer steel; why at some points in the rails or bars they will break so easily, and at others are so very tenacious,—and while I am not prepared to say that any one combination of any substance, as now known, is the cause, I am prepared to put myself on record, that it will be found a serious mistake to use iron with more than a trace of phosphorus, and that the less silicon left in the metal at the blowing, the better; also, that the introduction of any more manganese than is needed to remove the oxygen remaining in the metal after the blowing, does not add to its strength, to say the least.

In my experiments in smelting Bessemer scrap, I have experienced many serious obstacles, some of which I have overcome, and I am now producing a very fine tool steel entirely from Bessemer scrap. I have succeeded in removing the cause of brittleness in cast steel made from Bessemer, to a certain extent, and am still experimenting.

I will, in a future article, set forth what I think is the cause, and my way of treating it. W. A. S.

Some Experiments on Coking Coals Under Pressure.

By E. T. COX, State Geologist, Indiana.*

WHILE engaged, in the year 1856, in determining the oil-bearing properties of some bituminous coals from western Kentucky, by subjecting them to dry distillation in an iron retort, which held about a pint, and to the neck of which were attached several bottles, for collecting the carbon oils, and washing and measuring the gas, I observed that there was a very great gain in the weight of coke thus made, over that obtained from the same coal when charred in a platinum crucible, as is usual in the laboratory for making the proximate analysis of coal.

It was thought at the time that the increase of coke, by the former mode of treating the coal, was due to the pressure which the retarded gas exerted upon the solid carbon, and the possible fixing of a portion of the carbon from the volatile hydrocarbons.

For the purpose of obtaining a more definite idea of the effects of pressure on the coking of coals, a series of experiments were made this spring under my direction, by my assistant, Dr. G. M. LEVETE. The results are highly instructive and full of interest, since they point out some peculiarities in the nature of bituminous coals which have not been noticed before, and are not fully understood. The apparatus employed in these experiments consisted of an iron retort that held about four ounces; the exit pipe or neck of this retort has a diameter of a quarter of an inch. To the outer end a small two-necked Woulff's bottle was attached to catch the carbon oils; from the other neck of the receiver the gas was conveyed to a washing bottle, and from thence to the bottom of a tall glass cylinder, tall enough to hold a column of twelve inches of mercury without danger of its being thrown out by the force of the escaping gas.

Ten grammes of pulverized coal were placed in the retort, and, after luting the rim with a paste made of fire clay, the cover was attached with a screw-clamp. The retort was placed in an iron cylinder lined with fire-clay, and maintained at a bright red heat to the end of the process, which usually took from forty to fifty minutes. The cylindrical furnace was surmounted by a tall sheet-iron chimney, and the heat was derived from a three-jet Bunsen burner, supplied with gas at a uniform pressure of 15-10 inches. The specimens of coal examined were bituminous and belonged to two varieties, caking and non-caking coal. They were selected without reference to special good qualities, but simply because they were convenient, and the proximate and ultimate constituents of most of them had previously been determined. The results are given in the following table:

COALS COKED UNDER DIFFERENT DEGREES OF PRESSURE.

Name of mine or owner.	Platinum crucible.	Iron retort.	Iron retort.	Iron retort.	Iron retort.
	Proximate analysis.	No mercury.	3 inches mercury.	6 inches mercury.	12 inches mercury.
No. 1. H. K. Wilson, Sullivan Co., Ind..	52.40	59.10	62.00	62.80	59.40
2. Stone's, Pittsburgh, Pa.....	57.90	65.05	65.00	65.10	66.10
3. Barnett's, Clay Co., Ind.....	58.50	62.20	61.75	62.60	63.40
4. Woodruff & Fletcher, Clay Co. Ind	57.50	58.85	60.40	58.50	59.25
5. Simonson's, Knox Co., Ind.....	52.50	54.35	54.00	54.30	56.50
5. Shepard & Haslett, " "	55.50	56.10	56.40	57.95	56.15

The first column contains the per cent. of coke as determined by proximate analysis. The second column, the per cent. obtained in the small iron retort without pressure. The third column contains the per cent. when the gas escaped from the retort under a pressure of a column of mercury three inches high; the fourth under a pressure of six inches of mercury; and the fifth under a pressure of twelve inches of mercury, or a little more than one-third of an atmosphere.

No. 1. HENRY K. WILSON's coal, Sullivan Co., Ind., is a glossy, jet-black caking coal. By proximate analysis it gave 52·40 per cent. of coke, which is but slightly puffed. Charred in the retort without pressure, there is a gain of 6·70 per cent. of close-grained coke. When twenty grammes of coal were used, instead of ten, the coke had a beautiful, radiated structure. The rays were formed of fine columnar crystals, which extend from a central core, in all directions, to the circumference.

Under a pressure of six inches of mercury, the coke was increased to 62·80 per cent., or 10·40 per cent. more than was obtained by the proximate analysis, and is close-grained and dense.

Under twelve inches pressure, there was a loss of over three per cent. in weight, but the coke still remained close-grained, and exhibited but little tendency to puff up.

In order to insure uniform results, about one pound of each coal examined was crushed in a mortar to a powder, and kept as a stock from which to weigh out the different quantities used in analysis.

Two experiments were made on the WILSON coal by coking small lumps instead of the powder; one with half an inch of pressure, and the other with twelve inches of pressure. In both cases the lumps fused on the edges, and cemented together like a pop corn ball. The surfaces were glazed, and in color and structure had a very close resemblance to anthracite. With the half-inch pressure, the coke weighed 62·10 per cent., and with twelve inches 59·40 per cent. The latter was slightly inclined to puff.

No. 2. Pittsburgh coal. This coal is from STONE's mine, second pool, Monongahela River, Pa. It is celebrated as a gas coal, both on account of the quantity and high candle power of its illuminating gas, and the superior coke which it makes in the gas retorts. By proximate analysis this coal gave 57·90 per cent. of coke, which is very much puffed. In the retort, without pressure, it gave 65·05 per cent., being an increase in weight of 7·15 per cent. It appears to have been thoroughly fused by the heat, and is slightly increased in bulk. The outside is smooth, but it is porous within. Under three inches of pressure, the coke is 65.00 per cent., and it is puffed; with six inches of pressure, it is very much puffed, and weighed 65·10 per cent.

With twelve inches of pressure, the coke reached 66 per cent., and is puffed up more than twice the size of that obtained without pressure. In shape it resembles a hen's egg, and contains a large cavity in the center; the shell being also very porous.

No. 3 is a very dry burning block coal from BARNETT's mine, Clay County, Indiana. By proximate analysis it gives 58 50 per cent. of coke, in a slightly coherent powder. In the retort, without pressure, it gave 62·20 per cent. of coke, but slightly coherent; a gain of 4 70 per cent. With three inches of pressure, the coke weighed 61·75 per cent.; a slight falling off in weight, and it was not perceptibly stronger. Under six inches of mercury pressure, the weight is 62·60 per cent., and the particles are a little more coherent; with twelve inches of pressure, the coke is 63·40 per cent.—a total increase of 4 90 per cent. Though not fused into a homogeneous coke, the particles are far more coherent in this than in that made without pressure.

No. 4. WOODRUFF & FLETCHER, block coal, Clay County, Indiana. By proximate analysis this coal gives 57·50 per cent. of slightly coherent coke. In the retort, without pressure, 58·85 per cent. of slightly coherent coke; with three inches of pressure, 60·40 per cent.; with six inches, 58·50 per cent.; and with twelve inches, 59·25 per cent.—a total increase of 1·75 per cent. The density of the coke increased regularly with the pressure, and that formed under the greatest pressure was remarkably strong and good.

Nos. 5 and 6 were caking coals from Knox County; their behavior was very similar, in some respects, to that of the Pittsburgh coal; though they did not puff up as much as the latter coal, the coke was full of large cells like a honeycomb.

When the washing-bottle was detached, at the end of each operation, from the tar and oil reservoir, if the pressure had been used, the confined gas would rush from the retort with great force, and make a whistling noise as it escaped from the neck of the bottle, which was of some moments' duration, and was distinctly heard in the adjoining room.

These experiments go to show that the temperature at which the fixed carbon of a coal will melt, depends upon the nature and arrangement of the protean compounds which enter into its composition. The fixed carbon of the Pittsburgh coal melts at a comparatively low temperature, and, under the increase of heat, induced by pressure, it becomes fluid enough to expand into a mere bubble. To make a dense coke of such a coal, instead of using pressure, the operation of coking should be conducted in ovens, where the gas could be removed by exhaustion as fast as formed.

This is done at the gas works; here the retorts are exhausted of gas as fast as it is formed, and the coke made in this way is very hard and strong. Coal, like that from Sullivan County, gives a better coke when pressure is applied, and the block coal is almost worthless for coke unless it is distilled under a very great pressure, since it takes a high temperature to fuse and cement its carbon particles together. These experiments also assist in explaining why some of the caking

*Read before the American Institute of Mining Engineers at the St. Louis meeting, May 28, 1874.

coals will not answer, in the raw state, as fuel for smelting iron in the blast furnace, and why the block coal is used advantageously for that purpose.

The closed top blast furnace, with its gas flues, may be, very properly, substituted for the retort in coking coal, with this advantage for the former: the coke is subjected to the additional pressure produced by the superimposed ore and limestone. In an experiment, not given in the table, it was found that the density and strength of the coke is materially increased by covering it with an inch of sand and permitting the gas to escape without additional pressure.

I claim, therefore, that the dry burning or block coal of Indiana, contrary to the commonly received opinion, can be made, under proper treatment, into a remarkably strong and dense coke; one of the essential conditions being a suitable degree of pressure to ensure heat enough to fuse its refractory carbon into a homogeneous mass.

I believe, furthermore, that the above mode of testing coal is calculated to give a far better idea of its value as a fuel than it is possible to obtain by the ordinary proximate analysis. It enables us to know at once under what conditions a coal must be distilled in order to fuse its carbon into a strong and dense coke. It teaches us, also, how a bituminous coal, when subjected to heat under pressure, may be converted into anthracite and not coke.

It is my intention to pursue still further the investigation of coking coal under pressure, and I will arrange an apparatus for that purpose which will secure a pressure at least equal to one atmosphere. I will also test the effect of a reverse operation by exhausting the retort with a Sprengel's vacuum pump. By these means, then, I believe that it is possible to point out the way to make a good coke from any coal which is not too much contaminated with sulphur and other deleterious impurities.

On the Condition of Carbon in Gray and White Pig Iron.*

By Dr. Thomas M. Drown.

I desire to communicate to the Institute the results of a few analyses which bear on the condition of carbon in gray and white iron. These analyses were made in the course of an investigation, now in progress, of the chemical composition of "chilling" irons. It will be remembered that Bell says he found no material difference in the amount and condition of carbon in gray and white pig iron made at the Clarence furnace, in England, and he therefore refers the difference in color and appearance in these two varieties of iron to the size of the particles of graphite. I quote from his *Chemical Phenomena of Iron Smelting:* "The inference I would draw from the information afforded by these analyses is, that the condition of iron in respect to its so-called 'richness' is, within certain limits, entirely independent of its chemical constitution. * * * * * In the fluid state, I conceive the carbon, so taken up, confers upon the iron the property of fusion much below the temperature at which the pure metal melts, and the carbon itself may be regarded as dissolved in the iron. If, during the process of manufacture, the pig metal has been formed at a low temperature, consolidation, I imagine, takes place under such circumstances that the crystals are so minute, and the carbon which is separated assumes the uncombined or graphitic form in particles so minute as to be invisible, and in consequence, the iron is white. If, on the other hand, the furnace is working at a very high temperature, the intensely heated iron crystallizes with large facets, upon which the extruded carbon assumes the condition of distinct plates or flakes. Should the temperature be less intense, these crystals are of smaller dimensions, and the separated carbon is less conspicuous, and, as the temperature of the furnace declines, the crystals decrease in size, as do the flakes of carbon, until both disappear in white iron. * * * * Returning, then, to temperature as the cause of differences in quality of pig iron, the 'chilling' of gray metal, and its conversion into white, may be regarded as the effect of preventing, by rapid cooling, the formation of crystals sufficient in size to render their coating of carbon visible." The influence of temperature—of slow or rapid cooling—in determining the character and color of pig iron is well known, but the idea that white iron differs from gray mainly, if not wholly, in the size of the graphite particles is not only opposed to the analytical results obtained by chemists, hitherto, but also seems incapable of accounting for the difference in the physical properties of the two varieties of iron.

The samples I used for analysis were taken from a small ingot of gray charcoal iron that was cast in a "chill" mould. For the depth of about half an inch the iron was perfectly white, while the remainder was dark gray. Planings of the former and borings of the latter were obtained for examination. The total carbon (determined by treatment with chloride of copper and combustion of the carbon in oxgen in the usual way) in the gray portion was found to be, in duplicate analyses, 4.10 and 4.13 per cent., and in the chilled portion, 4.21 and 4.23 per cent. The difference is here too great to be referred to errors of analysis. To what it is due I am not prepared to say, but would suggest that there may be a slight loss of carbon in the form of light particles of graphite in boring, Snellus' admirable mechanical analysis of gray pig iron proving that such a loss is, at least, possible. To determine the graphite, samples were treated with an excess of hydrochloric acid (sp. gr. 1.12) and digested for some time at a moderate heat (as recommended by Fresenius), and finally evaporated to dryness. The residue was taken up in dilute hydrochloric acid, filtered through asbestos and washed with water, caustic soda, alcohol, and ether. The results for the gray portion were 2.84 and 2.85 per cent., and for the white portion 1.31 and 1.47 per cent. The difference in the two portions was not so great as was anticipated, and, moreover, the two determinations in the "chill" differed too widely to be satisfactory. Samples were then boiled briskly with hydrochloric acid for half an hour, filtered directly and washed as before. The results were for the gray portion 2.46 and 2.50, and for the white 0.21 and 0.23 per cent. The first method of treatment was thus shown to be entirely inadequate to decompose the carbide of iron, especially in the white iron. Whether the decomposition was absolutely complete in the second case I cannot say, but the results show that at least 94 per cent. of the carbon was chemically combined with the iron, for on no other supposition can we explain its escape as gaseous hydrocarbons under the action of muriatic acid. I have not had the opportunity, as yet, to determine the amount of carbon in the gases evolved in the treatment of the two varieties of pig iron, but this method could not, I think, fail to confirm the other. The question resolves itself, therefore, solely into one of chemical methods, and until it is clearly settled what shall be called graphite in analysis, further discussion of the subject is profitless. My examination of other methods than those mentioned above has, thus far, only extended to the use of nitric acid and aqua regia, to discover to what extent the graphite would be oxidized by these reagents. The samples were directly treated with an excess of nitric acid (sp. gr. 1.27) and when ebullition had ceased, hydrochloric acid was added, and the solution evaporated to dryness. It was then taken up by dilute acid, filtered and washed thoroughly with water. The results for the gray portion were 2.37 and 2.37 per cent. graphite, and for the white, 0.06 and 0.08 per cent. Thus, while the gray iron only lost 44 per cent. carbon on the previous determinations of graphite (2.48 per cent.), the white iron lost 68 per cent. This may either indicate that the white iron was less thoroughly decomposed by treatment with boiling hydrochloric acid than the gray, or that the particles of graphite in the former were so much smaller that they were readily attacked by the oxidizing acids.

The amount of graphite separated in any given instance in pig iron seems to be proportional to the time required for solidification. This time is dependent on the temperature of the molten metal, on its fusibility—i. e., on its composition—and on the rate of cooling. Bell, as quoted above, refers the cause of the formation of gray or white iron solely to the temperature (leaving out of consideration the possible action of sulphur). This statement may possibly be found all-comprehensive, since the higher the temperature, the more carbon and silicon will the iron take up (other things being equal), and the more fusible it will become. As an attempt to explain why a larger amount of graphite should be separated under such circumstances, I would offer the following suggestion: That there is a limited range of temperature, probably near the point of solidification of the metal, within which the separation of carbon from the iron takes place, and that the amount of carbon separated in any given instance is proportional to the time consumed by the cooling pig iron in passing through this range of temperature. It is evident that the time required for the metal to cool a given number of degrees, near its point of solidification, must depend partly on the temperature of the surrounding moulds. The hotter the metal leaving the furnace, the more will it have heated the moulds as it approaches solidification, and, consequently, the slower will have become the rate of cooling, the longer will be the period during which carbon can separate, and the larger will be the amount of graphitic carbon in the final product.

* A paper read before the American Institute of Mining Engineers, at St. Louis, May, 1874.

Notes.

Effect of Soap-water on Incandescent Metals.—A red-hot copper ball, plunged beneath the surface of water containing soap, remains quiet, being surrounded with a thick envelop of vapor.

The Reduction of Ferric to Ferrous Salts in the Quantitative Analysis of Iron Minerals.—Ad. Kopp calls attention to the fact that the tediousness of reducing the iron solution by zinc is vastly relieved by the addition of a little stannous chloride previously. The zinc, subsequently added, reduces the tin to the metallic state, when it is removed by filtration and the liquid titred as usual.

Heat Absorbed at High Temperatures, by Pig Iron, Cinder and Steel.—The following are the conclusions arrived at by Prof. Gruner in his late pamphlet on this subject:

1st. The gray pig irons do not carry with them from the furnace more than 280 to 285 calorics, but at the top of the hearth often possess 300 to 310 calorics.

2nd. The white pig irons contain, under the same conditions of production, 20 calorics less.

3rd. The gray irons still retain at the point of solidification 244 to 245 calorics; and immediately after solidification 221 to 222 calorics.

4th. The white irons still retain at the point of solidification 226 to 235 calorics; and directly after solidification 192 to 203 calorics. This would give the latent heat of the white irons as 32 to 34 calorics, while that of the gray irons is only 23 calorics; a difference which arises from the fact that the impure gray irons remain soft and half disaggregated after their solidification, while the pure irons harden at once.

5th. The heat possessed by the cinders is about 16-10ths of that retained by the pig irons at the same temperatures; *e. g.*, in the case of gray irons at the moment of tapping, the maximum is 500 calorics, while in the case of the white irons it is 450.

6th. The latent heat of the cinders is about 50 calorics.

7th. Bessemer steel gains by refining 30 calorics above the heat possessed by the pig iron; but ordinary steel frequently possesses, when in a melted condition, but 300 calorics.

8th. The quantities of heat in question agree very well with the temperatures of fusion determined by Pouillet; that is to say, the white irons melt between 1050°C. and 1100° C.

The gray siliceous irons melt at about 1200° C.

Ordinary steel melts at about 1350° to 1400° C.

And it may be added that the white irons possess, when leaving the blast-furnace, a temperture of 1250° to 1300° C.

The gray irons 1350° to 1450° C.

Bessemer steel attains in the converter, at the period of refining, a temperature of at least 1500° C.

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CONTENTS FOR THIS WEEK.

On the Fracture of Steel Rails	145	The Classification and Heating Power of Coals	149
Some Experiments of Coking Coals under Pressure	146	Hand-worked Coal-Cutting Machines	149
On the Condition of Carbon in Gray and White Pig Iron	147	Fires in the Wilkes-Barre Mines	150
Notes	147	COAL TRADE REVIEW	150
EDITORIALS :		Review of the British Coal and Iron Trade	153
Change of Address	148	IRON MARKET REVIEW	153
Correction	148	Metals	154
The Centennial Exhibition	148	San Francisco Stock Market	154
Professor Tyndall's Address to the British Association	148	Boston Stock Market	154
		American Institute of Mining Engineers	155
		Advertisements	155

Change of Address.

DR. TH. M. DROWN, Secretary of the American Institute of Mining Engineers, having recently been appointed Professor of Analytical Chemistry, at Layfayette, College, Easton, Pa., members of the Institute will please notice the change of address from Philadelphia to Easton, Pa.

Correction.

IN our Nova Scotia correspondence, last week, there occurred a typographical error in writing *Diamond* for *Drummond*. As the latter name is but too familiar recalling, as it does, the fearful accident at that colliery a year ago, probably few, if any, of our readers were misled. As there is, however, a Diamond colliery in Nova Scotia we desire to make the correction.

The Centennial Exhibition.

THE United States Centennial Commission announces its readiness to receive applications for space in the International Exhibition of 1876, at Philadelphia. It is important that it should be known, with the least possible delay, what space will be required in each of the departments of the Exhibition by American exhibitors, in order that it may be determined what room can be assigned to foreign nations. Manufacturers and others who purpose exhibiting on this occasion, should, therefore, make known their intention promptly, and thus avoid the disappointment of finding the room they desire pre-occupied.

It is especially desirable that early provision should be made for the organization of those collective exhibitions of the natural resources and raw materials of different sections of the country, which cannot be made by individual exhibitors. The importance of this, as an incentive to immigration, and to the investment of foreign capital, cannot be over-estimated ; and a liberal provision for the prompt and thorough performance of the work will amply repay those States which undertake it.

The advertisement of the Director-General of the International Exhibition tells in what manner applications should be made.

Professor Tyndall's Address to the British Association.

WE regret we cannot afford the space to give in full to our readers this very wonderful exposition of the scope and present standpoint of scientific investigation ; it will, undoubtedly, excite much comment and be subjected to much adverse and thoughtless criticism. The following extracts, which we take from the special correspondence of the N. Y. *Tribune*, will explain very clearly Prof. TYNDALL's position on the question of "Creation by Law."

"The origination of life is a point lightly touched upon, if at all, by Mr. DARWIN and MR. SPENCER. Diminishing gradually the number of progenitors, MR. DARWIN comes at length to one "primordial form ;" but he does not say, as far as I remember, how he supposes this form to have been introduced. He quotes with satisfaction the words of a celebrated author and divine who had 'gradually learnt to see that it is just as noble a conception of the Deity to believe He created a few original forms, capable of self-development into other and needful forms, as to believe that He required a fresh act of creation to supply the voids caused by the action of His laws.' What Mr. DARWIN thinks of this view of the introduction of life I do not know. Whether he does or does not introduce his "primordial form" by a creative act I do not know. But the question will inevitably be asked, 'How came the form there?' With regard to the diminution of the number of created forms, one does not see that much advantage is gained by it. The anthropomorphism which it seemed the object of Mr. DARWIN to set aside, is as firmly associated with the creation of a few forms as with the creation of a multitude. We need clearness and thoroughness here. Two courses and two only are possible. Either let us open our doors freely to the conception of creative acts, or, abandoning them, let us radically change our notions of matter. If we look at matter as pictured by Democritus, and as defined for generations in our scientific text-books, the absolute impossibility of any form of life coming out of it would be sufficient to render any other hypothesis preferable ; but the definitions of matter given in our text-books were intended to cover its purely physical and mechanical properties. And, taught as we have been to regard these definitions as complete, we naturally and rightly reject the monstrous notion that out of such matter any form of life could possibly arise. But are the definitions complete? Everything depends on the answer to be given to this question.

"Trace the line of life backward, and see it approaching more and more to what we call the purely physical condition. We reach at length those organisms which I have compared to drops of oil suspended in a mixture of alcohol and water. We reach the *protogenes* of HAECKEL, in which we have 'a type distinguishable from a fragment of albumen only by its finely granular character.' Can we pause here? We break a magnet, and find two poles in each of its fragments. We continue the process of breaking, but however small the parts, each carries with it, though enfeebled, the polarity of the whole. And when we can break no longer, we prolong the intellectual vision to the polar molecules. Are we not urged to do something similar in the case of life? Is there not a temptation to close to some extent with LUCRETIUS, when he affirms that 'nature is seen to do all things spontaneously of herself without the meddling of the gods?' or with BRUNO, when he declares 'that matter is not that mere empty capacity which philosophers have pictured her to be, but the universal mother who brings forth all things as the fruit of her womb?'"

The questions here raised, continues Prof. TYNDALL, are inevitable. They are approaching us with accelerated speed, and it is not a matter of indifference whether they are introduced with reverence or with irreverence. He, at least, hesitates no longer, but plainly, weightily, solemnly says :

"Abandoning all disguise, the confession that I feel bound to make before you is that I prolong the vision backward across the boundary of the experimental evidence, and discern in that Matter which we, in our ignorance, and notwithstanding our professed reverence for its Creator, have hitherto covered with opprobrium, the promise and potency of every form and quality of life."

The expression of so remarkable an intellect, trained by a lifetime of the closest observation and profoundest thought, that it "discerns in Matter the promise and potency of every form and quality of life," is not to be silenced because it may contradict some preconceived ideas of our own.

SCIENCE IS THE INVESTIGATION OF TRUTH. And truth can never conflict with, but rather teaches us the true appreciation of, that Power which has created and endowed Matter with a property which, should TYNDALL be correct, contains "the promise and potency of every form and quality of life." The investigations of such true and honest students of nature invariably lead to the conclusion boldly admitted, that "the whole process of evolution is the manifestation of a Power absolutely inscrutable to the intellect of man. As little in our day as in the days of Job can man by searching find this Power out. Considered fundamentally it is by the operation of an insoluble mystery that life is evolved, species differentiated, and mind unfolded from their prepotent elements in the immeasurable past."

And here is confirmation for the belief in a Creator, the Great First Cause. We may go back never so far, and we find the Infinite beyond us. And when TYNDALL says that matter possesses in itself the promise and potency of life, he merely asserts that matter is governed by a Law which we may call the Will of the Creator. So that the Infinite, instead of having exercised an independent act of creation for each of an innumerable number of objects, has created all by the varying operation of a uniform Law. TYNDALL well expresses this craving of the inner man for a conception which mere knowledge of the physical universe can never satisfy, when he says :

"I would set forth equally the inexorable advance of man's understanding in the path of knowledge, and the unquenchable claims of his emotional nature which the understanding can never satisfy. The world embraces not only a NEWTON, but a SHAKESPEARE—not only a BOYLE, but a RAPHAEL—not only a KANT, but a BEETHOVEN—not only a DARWIN, but a CARLYLE. Not in each of these, but in all, is human nature whole. They are not opposed, but supplementary—not mutually exclusive, but reconcilable. And if still unsatisfied, the human mind, with the yearning of a pilgrim to his distant home, will turn to the mystery from which it has emerged, seeking so to fashion it as to give unity to thought and faith; so long as this is done, not only without intolerance or bigotry of any kind, but with the enlightened recognition that ultimate fixity of conception is here unattainable, and that each succeeding age must be held free to fashion the mystery in accordance with its own needs—then, in opposition to all the restrictions of materialism, I would affirm this to be a field for the noblest exercise of what, in contrast with the knowing faculties, may be called the creative faculties of man. Here, however, I must quit a theme too great for me to handle, but which will be handled by the loftiest minds ages after you and I, like streaks of morning cloud, shall have melted into the infinite azure of the past."

Pig Irons Rich in Silicon.—L. TROOST and P. HAUTEFEUILLE, in the *Annales des Mines*, come to the same conclusion as JORDAN with respect to the production of a siliceous pig iron. They found that a very siliceous pig iron could be retained at a high state of fusion in a very quiet condition when melted in a lime crucible ; while ordinary pig iron emitted sparks due to its absorption of H and CO.

Hand-Worked Coal Cutting Machines.

On the 17th of August, a number of manufacturers met at Dudley, under the auspices of the South Staffordshire and East Worcestershire Institute of Mining Engineers, to compete for a premium offered by the Institute for the best hand-worked coal-cutting machine. The competition took place in No. 58 pit, Old Park Colliery, Dudley.

Three machines had been entered for trial, viz., Mr. J. G. JONES's patent, by Mr. MACDERMOT, London; Mr. R. S. NORRIS's patent; and Mr. J. E. SMITH's patent. The coal selected for the purpose was the famous thick coal (100 yards deep), which is of a very hard nature.

Mr. JONES's patent was first put in operation in the square work. It is worked exclusively by the hand labor of two men, one boy managing the small wheel, by which the cutting bar is kept up to its work. The cutting bar is formed by threading or stringing on a steel bar a number of small circular saws, 2½ inches or 3 inches in diameter, each saw having eight cutting points. These small saws are fixed on the bar obliquely with an interval between them (regulated by distance pieces or tubes cut to the same oblique angle as the saws are set at) of 1 inch, the angle being such that the uppermost point of one saw covers the undermost point of the next, thus making the cut continuous. To this bar is given a double motion. It revolves rapidly on its own axis, whilst it is swept round horizontally in the arch of a circle, the center of which is the center of the machine, both of these movements being made simultaneously. The two main handles (or wheels) worked by the men give the bar its motion of revolution on its own axis; a boy managing the smaller (horizontal) wheel, which regulates the sweep of the bar into and out of the coal. The gearing for regulating the revolution of the bar is enclosed in a cast-iron casing, the bed-plate of which drops upon two light rails, 12 inches apart, supplied with the machine. The mode of action is as follows:—A length of rail having been laid down parallel with the face of the coal, the coal-cutter is placed on the rails, to which it is securely clamped. Given a loose end to begin on, the bar is swept round, cutting its way outwards in the arc of a circle, until it has cut a groove equal to its sweep clear to the face. The machine is then unclamped, moved to its new position, say 12 inches further on, and cuts a second groove in the same manner; and so the work is carried on. The machine weighs about 2½ cwt. The cutters are all separate and easily fixed on the bar, or removed without altering the position of the machine. Height, from 2 to 3 feet. Width, about 15 inches. Height of groove-cut, 2½ inches. Depth of holing, 2 feet to 6 feet. After the machine had been at work a short time, it was found that several of the teeth of the saw were broken. Fresh teeth were fitted in, and the machine was soon in operation again. The machine is worked exclusively by the hand labor of two men and a boy. The labor was exceedingly hard, and very few men would be able to stand it for more than ten minutes at a stretch. This seemed to be the opinion of all present. Some of the members of the Institute expressed themselves to the effect that not more than two or three out of a hundred men would be found willing, even if they were able, to work so hard as the men did yesterday. It must, however, be remembered that the coal was exceedingly hard—as hard, perhaps, as any in the world; and it is a question whether improvements might not be introduced to reduce the amount of labor required. A length of 2½ feet and 2 feet 3 inches in depth was cut in an hour by this machine.

The next machine tried was Mr. NORRIS's patent. It is mounted on a cast iron bed, upon which is caused to slide, by means of hand, steam, or other power, a carriage made sufficiently long to admit the traverse or progress of the drill to penetrate the coal to the depth of 3 ft. or more. This cast iron carriage can be arranged for any number of drills, the two inner ones being worked directly off the screw shaft by means of a driving pinion; the others, being in gear, receive their revolving motion from the same source. The traverse motion, or feed, is accomplished by means of two pinions, cast or keyed on to the two inner bosses, and geared into the nut pinion, which has a thread through it, and runs loose on the screw shaft. The clutch-box is so arranged, that when in gear the whole of the drills revolve, and, at the same time, the necessary feed is given. This action continues until the drills, or cutters, have slotted the coal to the required depth; then, by means of a reversing lever, the clutch is thrown out of gear, and the carriage brought back to its original position by means of the screw shaft, which transmits its power through a nut pinion, held in position by other pinions. This machine is worked with less trouble than Mr. JONES's patent, and favorable opinions were expressed in reference to its mode of action. It bored 2 ft. 9½ in. by 4 in. in half an hour.

Mr. SMITH's patent did not seem to be at all adapted for cutting thick coal, and he withdrew from the contest. The machine consists of a strong frame about 2 ft. square, mounted and swivelling on a suitable wagon, provided with rollers or wheels suitable for the pit tramways. This frame carries a cutting head, provided with lateral and forward actions, available at any angle, and will cut a slot in the coal between 2 and 3 ft. deep, about 10 in. in length, and about 3 in. wide; it can be actuated and managed by a man and boy; weight about 2 cwt.

There was a great diversity of opinion among the visitors in reference to the machines. As to which has gained the premium of fifty guineas offered by the Institute, nothing can be stated. The matter will be decided by the Council, and the result will be made known at the first meeting of the Institute on the 7th prox.

The President said he was sorry that Mr. JAMES DONALDSON, of Birkenhead, was unable to be present to exhibit his design for a hand-worked coal-cutting machine, and to give a personal explanation; but the design was before the members, and the Secretary would read a short description:

"The principal cause of failure in the majority of existing coal-cutting machines lies in their rotary or grinding motion; the tools of such machines can never stand the wear and tear, which is the same in action as holding them to a grindstone. To obviate this, we must go back to the action or motion of the pick or jumper, as used in the hands of the miner—that is to say, a sharp, sudden blow. In the design accompanying this description, I have used for this purpose a series of cams or weights (crank or eccentric being too slow); in this particular case I have used three tools—two for holing out top and bottom cut, and the third acting as a lever to break away the intervening piece. The whole travels horizontally by screw motion driven by toothed gearing. The force of the blow, if driven by one man, could equal from one-quarter to half a cwt. The principle of the machine could be modified in various ways. For instance, the tool-bars could be made to revolve, as in the action of a jumper, by using a fixed rack and travelling pinions, and using a broad cutting tool let into the end of the bar. The only difficulty in applying it to vertical cutting in deep seams is in fixing it so as to be stable enough to resist the blow; in thin seams, such as 4 ft., &c., it can, as in the drawing, be fixed between roof and floor, by means of adjusting screws. The machines might also be made more portable by affixing wheels. The method of feeding is by having the screwed end of the tool-bar working into a nut fixed into the end of a strong wrought-iron tube, which, being turned by hand, forces the tool forward."

An ordinary pikeman in the same coalfield will "hole" in six hours a depth of 3 ft., 4 yards in length. It is easy, therefore, to estimate what is the precise value of the inventions which have, during the past week, attracted so much attention. Another point worth considering is the comparative waste of coal by the process of cutting by hand labor and machine labor respectively. A pikeman, in hewing a ton of coal, requires an average width of nine inches from the solid coal-bed, which he converts into slack, worth at least one-third the price of coal. The machine only extracts a rib out of the solid coal-bed of four inches, but it is all in the shape of powder, and therefore possesses no commercial value.—*Colliery Guardian.*

The Classification and Heating Power of Coals.

Translated from the French of M. L. GRUNER, by R. P. ROTHWELL, Mining Engineer.

(CONTINUED FROM PAGE 114.)

In confirmation of the tests made by SCHEURER-KESTNER and MEUNIER, who found for long-flaming caking coals 8500 to 8800 calorics, we will cite some experiments on steam generation, particularly those of Dr. BRIX and of SCHEURER-KESTNER and MEUNIER themselves.

	Proportion in 100 of coal.		Weight of Water at 0° C. vaporized at 112° C. per kilog. of coal burnt.		Remarks.
	Water.	Ash.	Merchant Coal.	Pure coal, (without ash.)	
			Kilog.	Kilog.	
Coal from the upper beds of Friedrichsthal, (Saarbrück).	1.00	12.70	6.31	7.73	Semi-caking coal, with 41.5 per cent. of vol. matter. (SCHEURER-KESTNER.)
Coal from Sulzbach	1.63	10.46	6.61	7.76	Long-flaming caking coal, from the Saarbrück basin. (SCHEURER-KESTNER.)
" " Duttweiler	1.75	13.25	6.79	8.25	
" " Heinitz	1.79	11.57	6.91	7.83	
" " Attenwald	2.54	13.50	6.95	8.27	
" " the Blücher bed Heinitz (Saarbrück).	2.00	2.28	7.83	8.18	Samples containing very little ash. (Dr. BRIX.)
Coal from Duttweiler, Natzmer bed.	1.50	1.11	7.80	8.01	

From this table we may conclude that long-flaming caking coals, dry and without ash, yielding 60 to 68 per cent. of coke, can vaporize, on an average, 8 kilo. of water with one kilo. coal. The extreme limits are 7·50 kilo. for coals giving a glassy coke (*Sinter-Kohlen*), and 8·30 kilo. for those approaching the limits of the ordinary caking coals. Merchant coal, containing 10 per cent. ash and water, will vaporize from 7 kilo. to 7·50 kilo. In the Woolwich and Portsmouth experiments, the long-flaming Hartley (Newcastle) coal vaporized 7 kilo. to 7·75 kilo. of water, when the proportion of ash and water was 5 to 8 per cent.—a result which differs but little from the above.

Caking Coals, or Smiths' Coals.

The coals of this third class are glistening black, rather soft, and of a foliated or shelly structure. They burn with a shorter and brighter flame, and with less smoke, than the gas coals or long-flaming dry coals. They soften, or even melt completely, like resin, in the fire; and while they contain less volatile matter than the long-flaming coals, they yet swell more in burning. Owing to its melting in the fire, the fine coal sticks together, forming a compact mass, which forms an arch over the iron in the smith's fire, hence its name in commerce—"*Smiths' Coal.*" This same quality makes it a good coking coal. The mean specific gravity of caking coals is 1·30, and the cubic meter, in pieces, weighs from 750 to 800 kilos.

The elementary composition of caking coals is as follows:—

Carbon.....84 to 89·0
Hydrogen.....5 to 5·5
Oxygen and Nitrogen...11 to 5·5
} from which the ratio $\frac{O+Az}{H}$ is included between 2 and 1.

100

The proximate analysis gives

Coke, compact and well melted.....68 to 74
Ammoniacal water.....3 to 1
Bitumen.....13 to 10
Gas.....16 to 15
} Volatile matter.....32 to 26.

100

The calorimetric experiments of SCHEURER-KESTNER and MEUNIER give the heating power of these caking coals, when pure, without either water or ash, as 8,800 to 9,300 calorics. We may specially mention the Ronchamp, Denain, and

Auzin coals of the table p. 34. Caking coals of this class are very abundant in France, especially in the St. Etienne basin and the middle portion of the Nord and Pas-de-Calais basins; they are also abundant in Belgium (near Liege, and in the lower part of the Mons basin); in Westphalia (in the Ruhr basin), and in the lower division of the Yorkshire fields. In Wales, the only coal of this class is at the eastern end of the field, near Newport.

The following are analyses of some smiths' coals from different countries:—

Origin of the Coals.	Composition after deducting the Ash. O	H	O+Az	Vol. matter in pure coal without ash.	Nature and appearance of Coke.	Remarks.
Coal from the Grand Croix Rive de Gier. Upper division of the great bed.	89.04	5.23	5.73	31.5	Melted, greatly swelled up.	Coals used specially for making gas. Analysis by M. REGNAULT.
Coal from the Grand Croix Rive de Gier. Lower division of the great bed.	89.07	4.93	6.00	30.2	Well melted but less swelled up.	
Caking Coal from Newcastle.	89.19	5.31	5 50	..	Well melted.	Analysis by Mr. RICHARDSON.
Caking Coal from Durham.	85.43	5.30	9.27	..	do.	do.
Mean of 5 beds from Denain, near Valenciennes,	86.79	5.54	7.67	32.8 to 35.0	do.	Analysis by M. DE MARSILLY
Mean of 9 beds of the Valenciennes basin.	87.75	5.19	7.06	26.2 to 32.3	do.	These coals change partly into short-flaming coals.
Mean of 3 beds from Lens, Hersin, and Bely-Montigny, (Pas de Calais).	87.59	5.43	6.98	24 to 32	do.	

The Bochum and Essen coals of Westphalia are also, according to the analyses of Dr. HEINTZ, chiefly smiths' coals, whose composition agrees with the above. At Bochum, however, we find, in the upper series, some long-flaming coals, which contain but 82 per cent. of carbon, and of oxygen and azote but 12 to 13 per cent.

Examining these analyses of caking coals, we are struck with the great lack of agreement between the elementary composition and the proportion of volatile matter yielded in distillation. Thus, the coals from the Grand Croix, which contain 89 per cent. of carbon and 11 per cent. of gaseous elements, yield 30 to 32 per cent. of volatile matter, while the Valenciennes and Pas-de-Calais coals, which contain less than 82 per cent. carbon, and more than 12 per cent. gaseous elements, often yield in distillation but 24, 26, and, at most, 32 per cent. of volatile matter. The contrast is still greater when we compare the Ronchamp coal with that from the Chaptal pit of the Creuzot, of which the analysis was given on p. 34. As already stated, the elementary composition is almost identical; and yet we cannot put the two coals in the same class. The first is an ordinary caking coal, containing 27 per cent. of volatile matter; while that from the Chaptal pit is a short-flaming coal, which yields only 19·6 per cent. of volatile matter. And this difference corresponds exactly to an excess of heat in burning of 545 calorics in the short-flaming coals.

A corresponding contrast exists between the Denain and Auzin coals and those of Duttweiler and Sultzbach (p. 50).

We may remark, moreover, that this lack of agreement between the elementary and proximate analyses is specially noticeable when we compare coals of different basins: Ronchamp and the Creuzot; Saarbrück and the Nord; La Loire and Pas-de-Calais.

Let us, in closing the subject of the smiths' coals, give the experiments on steam generation that have been made to determine their relative value.

Locality.	Proportion in 100 of coal. Water.	Ash.	Weight of Water at 0° C. vaporized per kilog. of coal burnt Merchant Coal.	Pure coal.	Remarks.
			Kilog.	Kilog.	
Ronchamp coal, 1st series of experiments, (tests).	0.66	12.74	7.14	8.72	Tests by SCHEURER-KESTNER. The 1st series of experiments gave a lower figure on account of the insufficient quantity of air for combustion.
Ronchamp coal, 2d series of tests.	1.09	16.19	7.62	9.16	
Coal from Wettin, Prussia,	0 60	11·96	7.65	8 75	
" " Eschweiler, "	0.80	3.30	8.76	9 18	
" " Engelsburg min (Ruhr basin).	1.40	3.25	8.31	8.72	Dr. BRIX.
Coal from the President mine, (Ruhr basin).	1.40	2.28	8.11	8.47	

This table shows that the smiths' coals, taken as pure, evaporate an average of 8·75 kilog. of water per kilog. of coal burnt; the extreme limits being 8·40 kilog. and 9·20 kilog. The merchant coals, containing 5 to 15 per cent. of foreign matter, evaporate 7·50 kilog. to 8·30 kilog., when the supply of air is sufficient.

TO BE CONTINUED.

Fires in the Wilkes-Barre Mines.

OUR correspondent, a few weeks ago, informed us of the success of the Lehigh and Wilkes-Barre Coal Company in extinguishing the fire in its Kidder Mine.

The spread of the fire in the Baltimore Mine has led the D. & H. Canal Company to adopt the same plan as the Wilkes-Barre Company, and we are now informed that "The fire at the Baltimore mine is pretty well closed in and twenty boilers are putting steam into it. Six more will be in operation in two or three days"

An explosion occurred at Hollenback No. 2 on August 31st by which three men were burned, and one of them very seriously. The mine is on fire, and work is somewhat delayed in the balance of the mine. It is not considered serious, and it is thought that in a few days it will be entirely extinguished.

COAL TRADE REVIEW.

This is the only report published that gives full and accurate returns of the production of our Anthracite mines.

NEW YORK, Sept. 4, 1874.

The Production of Anthracite Coal for the week ending Aug 29, 1874, was as follows:

Tons of 2240 lb.	WEEK. Tons.	YEAR* Tons.
Wyoming Region.		
Delaware and Hudson Canal Co	31,223	1,821,004
Delaware, Lackawanna and Western R.R	39,526	1,613,950
Pennsylvania Coal Co	31,274	852,277
Lehigh Valley R.R.	12,954	640,145
Pennsylvania and New York R.R	1,158	40,352
Central Railroad of New Jersey	15,767	879,287
Sold at the mines by L. & W. C. Co	300	12,375
	132,202	5,559,590
Lehigh Region.		
Lehigh Valley R.R	62,433	2,049,490
Central Railroad of New Jersey	27,523	691,729
Danville, Hazleton & W. B. R.R., 2 weeks.	2,344	25,150
	92,300	2,766,369
Schuylkill Region.		
Philadelphia and Reading R.R	11,052	3,016,748
Shamokin and Lykens Valley	13,915	566,238
	24,967	3,582,986
Sullivan Region.		
Sullivan and Erie R.R	1,065	24,631
Total of all the regions	250,534	11,933,576

* Year beginning Jan. 1.

The following table does not give the entire production of our bituminous mines, but it is by far the fullest report published.

The Production of Bituminous Coal for the week ending Aug. 29, was as follows:

Tons of 2000 lb.	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
Cumberland and Pennsylvania R.R.	41,313	1,501,986
Cumberland Branch R.R.	4,577	179,047
Barclay Region, Pa.		
Barclay R.R.	8,191	223,525
Broad Top Region, Pa.		
Huntingdon & Broad Top R.R.	....	....
Clearfield, Region, Pa, (2 weeks)		
Snow Shoe	2,072	41,481
Tyrone and Clearfield	23,806	403,773
Allegheny Region, Pa., (two weeks).		
Pennsylvania R.R.	6,994	142,909
Pittsburgh Region, Pa., (2 weeks).		
West Penn. R.R.	6,736	129,093
Southwest Penn. R.R.	294	4,836
Penn and Westmoreland gas coal, Pa. R.R.	34,297	610,856
Pennsylvania R.R.	23,562	292,894
Kanawha Region, W. Va.		
Chesapeake and Ohio R.R	5,735	94,465
Shipments from *Block House Region, Nova Scotia*, to Aug. 22.		
Consigned to the Provinces, tons 2240 lb	826	8,001
" " " United States " " "	1,303	11,760
" " Cuba, " " "	....	....
Shipments from *Pictou Region, Nova Scotia*, to August 22.		
Consigned to the United States tons 2240 lb.	2,169	35,391
" " " West Indies " " "	....	3,817
" " Canada " " "	5,264	68,380
" " Other provinces " " "	3,164	38,485

Production of Bituminous Coal.

1874.

Tons of 2000 lb.	6 months.	July.	7 months.
Blossburgh Region	367,766	78,600	446,366
Barclay Region	153,494	34,356	187,850
Broad-Top Region	120,708	14,520	135,228
Cumberland Region	1,178,507	254,812	1,433,319
Clearfield Region	331,794	59,331	391,125
Alleghany Region	115,950	13,832	129,782
Pittsburgh Region.			
West Penn. RR.	100,488	15,985	116,473
Southwest Penn. RR.	4,280	184	4,464
Gas Coal, Penn. RR.	443,280	97,321	540,601
Pittsburgh Coal, Penn. RR.	209,084	42,920	252,004
Saw Mill Run RR.	64,598	4,359	68,957
Cleveland and Pittsburgh RR.	128,210	22,335	150,549
Pittsburgh, Cincinnati and St. Louis R't	286,522	42,078	370,513
Erie and Pittsburgh RR	85,376	30,617	150,353
Pittsburgh, Fort Wayne and Chicago RR.	97,379	22,849	137,822
Castle Shannon RR.	69,180	8,321	77,601
Pittsburgh and Connellsville RR	193,721	26,922	220,643
Monongahela Nav. Co.	1,740,231	..	..
Keeling & Co.	51,314	..	..
Wettengal & Gormley	5,848	..	..
St. Louis Region.			
Belleville and Southern Illinois RR.	126,048	22,920	149,968
Ohio and Mississippi RR.	72,768	12,484	85,252
Illinois and St. Louis "	72,885	15,072	87,957
St. Louis, Vand., Terre Haute, and Ind. RR	50,000	10,069	60,069
St. Louis and Southeastern RR.	46,280	13,578	59,858
Cairo and St. Louis (narrow guage) RR.	14,702	498	15,200
Ind. and St. Louis RR	9,670	..	..
Toledo, Wabash and Western RR	1,054	..	..
Chicago and Alton RR.	4,216	..	..
Iron Mt. RR. (semi-Anthracite from Ark.)	675	..	..
Rockford, Rock Island and St. Louis RR	1,470	..	..
By Illinois River	1,320	..	..
" Ohio and Cumberland River,	12,515	..	..
Indiana North and South RR.	2,856	480	3,336
Evansville & Crawfordsville RR	7,704	629	8,333
Kanawha Region.			
Chesapeake and Ohio RR.	74,858	10,445	85,303
Warrior Region, Ala.			
South and North Alabama RR.	9,773	3,040	12,813
Cahaba Region, Ala.			
South and North Alabama RR.	1,977	150	2,127
Nova Scotia.			
Cumberland	25,711	..	..
Pictou	242,799	..	..
Cape Breton	278,943	..	..
Sundry	2,612	..	..
Total	6,808,566		

The Production of Coke for the week ending August 29:

Tons of 2000 lb.	Tons.	Year. Tons.
Tyrone and Clearfield	51	452
West Penn. R.R.	2,300	32,393
Southwest Penn. R.R	19,888	261,718
Gas Coal, Penn. R.R.	1,410	24,070
Pittsburgh Coal, Penn. R.R.	2,064	44,984
Monongahela Nav. Co., July	....	45,075
Pittsburgh & Connellsville RR., July	....	290,297

The production of Anthracite for the week ending August 29th was as follows: Wyoming Region 132,202 tons, being 22,103 tons less than the preceding week. In the Lehigh region, 92,300 tons, or 13,478 tons more than the week before, and in the Schuylkill region, 24,967 tons, being 47,721 tons less than the preceding week.

The total production of Anthracite from all the regions was for the week 250,534 tons, as against 307,079 tons the preceding week, and 515,590 tons for the corresponding week last year. From January 1st to August 29th, there were produced 11,933,576 tons, as against 12,846,336 tons for the same period last year. The figures of last year's production are taken from the Pottsville *Miners' Journal*.

The Delaware and Hudson Canal Company has at Honesdale 160,000 tons, at Rondout 40,000, at Weehawken 14,000 tons.

The receipts at Port Richmond were 700 tons; shipments, 38,000 tons; and balance on hand 52,000. Last week the balance was 88,000 tons.

The receipts at Greenwich, Philadelphia, were: bituminous 2021 tons, and gas coals 4496 tons; shipments: bituminous 2368 tons, and gas coals 5093 tons; balance on hand: bituminous 2588 tons, and gas coals 2191 tons.

The receipts of anthracite coal at Coal Port for the week were 4826 tons, and shipments 6221 tons; at South Amboy the receipts were 8705, and shipments 14,146. At both ports, since January 1st, the receipts were 612,624 tons, and shipments 600,770 tons, showing an accumulation of stock this year of 11,854 tons.

The production of Cumberland coal from January 1st to August 29, inclusive, was 1,681,233 net tons of 2000 lb., as compared with 1,736,717 net tons for the corresponding period last year. The production for the week was 45,890 tons, as compared with 61,977 tons for the corresponding week in 1873. This shows a decrease of 16,087 tons for the week, and a decrease for the year of 55,684 tons.

The receipts of coal at Buffalo for the week were 6237 tons. The shipments by Lake for the same period were 9740 tons.

The receipts of Cumberland coal at Locust Point, Baltimore, for the week were 29,500 gross tons. West Va. gas about 5000 tons.

The shipments of Blossburg coal from the mines for the month of August were 78,105 tons, and for the eight months, 524,471 net tons as compared with 689,960 tons for the same

period in 1873. Adding to this the consumption of coal at the mines, 12,842 tons, and the total production to the end of August was 537,313 tons.

The total production of bituminous coal, as reported to us, was for the first six months of this year 6,808,566 net tons. Our reports for July are not all in, but we have reported 858,707 tons for the month.

NEW YORK, September 4, 1874.

There is necessarily a monotonous uniformity in trade reports where there is no more life in business than we have had to note in the coal and iron trades for many months past. In the anthracite trade, business has been even more sluggish than the previous week. There is naturally a greater demand towards the close of the month, in order to lay in supplies before the monthly programme increase in price is made, but the beginning of the month shows always a relapse to the now old story of "nothing doing." It is particularly noticeable that very few consumers appear to be laying in stocks of coal, though no one doubts the maintenance of the combination policy of increasing the price during October and November. Undoubtedly the reason is to be found in the difficulty which most people find in obtaining money, and the consequent "hand to mouth" system of making purchases which is practiced in every department of domestic economy. For manufacturing purposes we regret to have to report very little demand, and nothing which would indicate any important revival in general manufacturing business. There is no concealing the fact that the country is still a long way off from that "good time" when business will be brisk and money plenty. Our dealers in most branches, while hoping for the best, are becoming more and more convinced that we are not going to do a much better business this autumn, and prices in all classes of merchandise, except anthracite coal (and copper), are falling.

The process of liquidation of debts has been steadily progressing since the panic, a year ago, and the total indebtedness of the country is to-day very much less than it has been for some years; but there are many yet struggling along under loads that are growing heavier, not in amount, but from the weariness which long carrying has caused, and many of this class must, before long, sink under the load they have so bravely borne for the past twelve months; while others, who do not sink, but get through safely, have been so hard pressed, they are not going to risk much for some time to come—hence we lose, for some time at least, a large part of that class of pushing, energetic, speculative men, who make business brisk and keep it moving. The lessons of the panic will not be forgotten this year, and we see little prospect of any very great revival in general business for several months to come. When our abundant harvests are marketed, even though it be at lower prices than may have been anticipated, there will be a greater demand for many classes of manufactures; and as stocks generally, except coal and iron, are small, any improvement in the consumptive demand will at once be felt throughout every branch of business.

The country is settling down to a stronger and lower basis for everything. Labor in almost every occupation is sold less to-day than it was a year ago, and the tendency is towards still lower, rather than higher, rates of remuneration. The products of labor have, in most cases, also diminished correspondingly. Does it require one exception, the anthracite trade, to prove the rule general, and what are the special conditions which so surround and govern the anthracite trade that it should be exempt from the general reduction obtaining in every other branch of business? What are the special conditions that make the forcing of the price of anthracite a legitimate, if not a laudable, business transaction, and which cause a corner in wheat or gold to be looked on as a transaction of more than doubtful morality? The subject opens before us, and we are reminded that our space is exceedingly limited. We shall, therefore, leave this discussion "to be continued in our next."

Anthracite.—The full and only correct reports published of the production of anthracite coal, which we give above, will well repay perusal every week, for they indicate with great correctness the real condition of trade. We see that stocks are diminishing nearly everywhere in first hands. The Combination has ordered a reduction in the output of the mines of 25 per cent. from the "ten million basis," for Sept. It is hoped that by the end of this month the demand will have overtaken the production, and that the output for the rest of the season will not be restricted below the "basis."

The mines at Wilkes-Barre and in the Schuylkill region have recommenced work. Our usual special reports give the condition of the trade in all the principal coal markets of the country.

Bituminous Coal.—There is no change to report in this branch of the trade. The Cumberland coal which we reported in stock at Georgetown and Alexandria last week has been worked off and very little has arrived. The bostmen are still on strike. The Consolidation Coal Company and Messrs. BORDEN & LOVELL have acceded, at least temporarily, to the demand for the increase in canal freights, and are now paying $1 35 instead of $1 25. The other companies are holding out, but are without stocks. There is not much demand, and the strike may continue through the present week.

There is no movement of foreign coals. We note, however, the sale of 1,000 tons Pictou for Cuba at $7 American gold, delivered. We note the arrival of a cargo in this port (500 tons) of Australian shale to which we referred some time ago. This peculiar variety of shale is very valuable as an enricher. It is used largely at Sydney, N. S. W., where it is said to yield 18,000 feet of 50 candle gas to the ton. Tests made at some of our New York works placed its value at about double that of best Cannel'on Cannel, which sells here now at $12 50 per ton. The actual cost of the Australian shale put down here is said to be $35@$36 gold. The importation must result in a considerable loss and will not be repeated. A large quantity of this shale is used in San Francisco and is said to give great satisfaction.

Wholesale Prices for Sept. of Anthracite f.o.b., at the Tide Water Shipping Ports per ton of 2240 lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
†Lackawanna and Scranton at E'port & Hoboken	5 25	5 35	5 45	5 60	6 10	5 05
‡Pittston at Newburgh	5 10	5 10	5 20	5 35	5 85	4 85
Wilkesbarre at Port Johnston	5 25	5 35	5 45	5 60	6 10	5 05
Plymouth, R. A	....	....	5 45	5 60	6 20	5 05
Susque. Coal Co. at Amboy W.A.	5 25	5 35	5 45	5 60	6 20	5 05
Kingston at Hoboken	5 25	5 35	5 45	5 60	6 10	5 03
Lehigh Coals.						
Old Company at Port Johnston	6 20	....	6 15	6 15	6 30	5 35
Old Company's Room Run "	5 70	....	5 70	5 70	6 05	5 05
Sugar Loaf at "	6 20	...	6 15	6 15	6 15	5 20
Lehigh Coal Exchange "	6 05	....	6 00	6 00	6 15	5 20
Honey Brook at Elizabethport	6 05	....	6 00	6 00	6 15	5 20
Spring Mt. C. Co. at Hoboken	6 05	....	6 00	6 00	6 15	5 20
Beaver Meadow at South Amboy	6 05	....	6 00	6 00	6 15	5 20
Schuylkill Coals at Port Richmond.						
Schuylkill white ash	4 75	4 85	4 95	5 10	5 60	4 15
Schuylkill red ash	...	....	5 10	5 20	5 65	4 40
Shamokin white and red ash	....	....	....	5 10	5 65	4 45
N. Franklin	....	....	5 55	5 55	5 60	4 30
Lorberry	....	....	5 90	5 90	5 90	4 50
Lykens Valley	....	....	....	6 55	6 55	5 10

† f. o. b. in New York Harbor.

‡ These are the rates for Pittston coal. Buyers having registered contracts will be charged 15 cents less than above prices.

	Per ton.
Freight from Hoboken and Weehawken to New York	40c.
" " Elizabethport & Port Johnston, to New York	40c.
" " South Amboy to New York	45c.
" " Newburgh to New York	65c.
" " Port Richmond, "Phila." to N. Y. alongside	95c.
" " Rondout to New York by boat or barges of the D. & H. Canal Co. "delivered"	50c.

Retail Prices.*

per 2000 lb. are as follows:

	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$5 90	$6 10	$5 20
Delaware & Hudson, delivered	6 85	7 10	6 35
Scranton, in yard	7 00	7 25	6 55
Wilkesbarre, delivered	6 85	7 10	6 35
Lehigh & Locust Mountain,	7 25	7 75	6 75
Schuylkill Red Ash	8 00		

* These rates will be advanced 25 cents per ton on the 5th of September, agreeable to the programme of the companies.

Cargo Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn, at Greenwich, Phila	$6 25	$7 65
" " at S. Amboy	7 00	....
Red Bank Cannel Pa., at Phil	8 50	9 50
" " at S. Amboy	9 00	....
" Orrel, "	7 00	7 65
" " at Phil	6 25	....
Youghiogheny, Waverly Co, at Baltimore	6 00	7 65
Despard, West Va. "	5 50	7 40
Murphy Run, W. Va. at Baltimore	5 50	7 40
Fairmount, W. Va "	5 50	7 40
Newburgh Orrel, Md. "	5 50	40
Cannelton Cannel, W. Va., at Richmond	11 00	12 00
" Splint, " "	5 50	7 50
Peytona Cannel, " "	....	12 50
Sterling " Ohio	....	14 00
Straitsville, " Lyonsdale Cannel	....	11 50
At Sandusky, O	3 90	....

FOREIGN GAS COALS.

	Sterling.	Am. cur'cy.
Newcastle, at Newcastle-on-Tyne*	12/@13/6	7 00@ 8 00
Liverpool House, Orrel at Liverpool	29/	13 00
Ince Hall Cannel "	52/	18 00
" Gas, Cannel "	40/	15 00
Scotch Gas, Cannel at Glasgow, nominal	28/	9 50
	Gold.	
Block House, at Cow Bay, N.S	2 25	6 00
Caledonia, at Port Caledonia	1 87½	5 56
Glace Bay, at Glace Bay	2 00	5 0
Lingan, at Lingan Bay	2 25	65 2
Sydney, International and Reserve mines, at Sydney	2 25	5 75
Pictou, Albion and Vale mines, at Pictou	2 50	6 50

STEAM AND HOUSE COALS.

Broad Top, at the mine, $1 25; at Port Richmond, Phil	4 75@5 00	6 00@6 25
Cumberland, at Georgetown and Alexandria, Va	4 30@4 40	6 50@6 75
Clearfield, "Derby," "Kitanning" and "Sterling," at the mines, $1 25; at Greenwich, Phil	4 75@5 00	6 25
James River, carbonite, at Richmond, Va	6 75	9 00
" bituminous, "	4 00	6 25

* Steam coals are quoted 1/ per ton above these prices.

Retail Prices in New York.

Per ton of 2000 lb.

Liverpool House Orrel	$20 00@22 00
Liverpool House Cannel	....@25 00
American Block	16 00@ ....
Straitsville Cannel	16 00@ ....
Carbonite	12 00@ ....

Coal Trade of Philadelphia.

PHILADELPHIA, Sept. 4, 1874.

Reported by our special correspondent.

There has been no increased movement in the coal trade for the past week, notwithstanding transportation was resumed on the 1st September on the Reading RR. and Schuylkill Canal, and mining operations generally. In the Schuylkill and Wyoming regions an improvement in the trade is confidently looked for, to begin during this month. Domestic consumers were never more backward in laying in their supplies than this year, and it is difficult to account for it, as there is hardly a possibility of lower prices between now and the first of January. In other channels of consumption the lessened demand is more easily accounted for by the blowing out of furnaces, the stoppage of rolling mills and forges, and the general stagnation and flatness of the manufacturing interests of New England.

The shipments for the past week have been light, notwithstanding the low rate of coastwise freights. It is understood the Eastern yards have not been depleted in their stocks during the late suspension, the only reduction being in the stocks at the tide water points of distribution. Shipping prices at Port Richmond, of course, remain the same for the month. Retail prices in this city have been advanced 25 cents a ton, as I stated last week.

Bituminous Coal, Wholesale.

Penn. and Westmoreland (Gas), f.o.b., Greenwich	5 25
Broad Top, (according to destination) f.o.b., Port Richmond	4 75@5 00
Clearfield f.o.b. at Greenwich, according to destination	4 75@5 00

Bituminous, Retail.

$6 00 in yard, per 2240 lb., cartage added.

Prices of Anthracite Coal for Aug., 1874, at Various Points.

Line prices for Lehigh have increased 15 cents excepting Furnace, which remain unchanged. The rates at Philadelphia remains the same. We refer to our issue of August 22d, any one desirous of consulting the list.

Baltimore, Md.

Sept. 2, 1874.

Reported by our Special Correspondent.

No improvement in trade to note. Large vessels chartered for Boston at $1 30 to $1 50; Sound Ports, $1 40; New York $1 25. Strike at Cumberland not yet settled.

WHOLESALE PRICES PER 2240 lb.

ANTHRACITE.

	afloat.	at depot.
Wilkes-Barre, "Lee," or "Diamond,"		
Lump, steamboat	$5 00	$5 40
Broken	5 25	5 50
Egg	5 62	5 90
Stove	5 82	6 10
Pittston and Plymouth.		
Lump, steamboat, and broken	....	5 45
Egg	....	5 80
Stove	....	6 00
Lykens Valley, red ash, all sizes	6 00	6 30

From wharf or yard, wholesale, 50@75c. additional.

By retail, all kinds and sizes, per 2,240 lb, $7@8 00.

BITUMINOUS.

George's Creek and Cumberland f. o. b. at Locust Point for cargoes	4 60	....
West Va. Gas Coal f. o. b. at Locust Point	5 50	....
Kanawha Cannel, coarse	13 00	....
Tyrone	7 25	....
Ritchie Mineral of West Virginia	1 00	....

Boston.

August 29, 1874.

Our correspondent, under date of September 2d, says: That the large shipping firms, such as E. A. PACKER & Co., WALTER DONALDSON & Co., MEEKER & DEAN, have plenty of orders on hand, and, in fact, there seems to be a general disposition among buyers to purchase of the "middle men."

From the *Commercial Bulletin*.

Anthracite is without noticeable change. There is, if anything, less business, notwithstanding the circular notification of the regular 15c. advance after September 1st. The yards here are getting somewhat anxious about the load they are carrying, and have carried since June last. The "cold snap" of the past two days would naturally be supposed to have been a reminder to the public that winter approaches, and the days of steady fires; but, singularly, there does not seem to have been a ton of coal ordered, or a yard enquiry made, by house-holders, in any degree suggestive that the past unseasonable weather had made an impression. A few of our leading retailing dealers have begun to gather estimates of the quantity of coal held in the yards of Boston and vicinity with a view of approximating to the possible condition of stocks when navigation closes. So far as learned, and four days have been given to the subject, it would appear that Boston proper now holds upon her wharves just about enough coal to last the city proper, for house and store uses, two and a half months. If the season sets in early and very cold, it looks as though by January duplicate cargoes through the bridges would be in demand; but the general economy of the masses, now so noticeable in their dealings with other markets, will lend its influences in the consumption of coal. What has been previously noted of our manufacturers' wants still holds good.

Foreign is unchanged. There have been several cargoes of provincial coals in this week, the favorable winds in the early days bringing along some who were anxiously looked for by the underwriters, if by none others. These cargoes had all been reported sold by us in May and June. We note the contract of four cargoes Sydney to arrive at $6 50 and change our quotations to correspond. Red Bank Cannel is doing a little better for grate fire uses, as is also Glace Bay. We note a cargo of cannel, 478 tons, ex Silistria, from Liverpool, discharging at Cambridge, which is quoting at $20@20; but the general gossip of the street is $18@19 on wharf.

We quote Anthracite cargoes, $6 50@7; retail, $8; Westmoreland, $7 75; Youghiogeny, $7 50; Red Bank Cannel, $10; Cannelton, $13 50; Cumberland, $5 90@6 20; Caledonia, $5 10; Lingan, $5 75; Glace Bay, $5 10; Block House, $5 10; Sydney, $7 00; Pictou, $6 15.

CARGO PRICES TO TRADE.

Reported by our Special Correspondent.

Lingan coal	$ 5 75	Westmoreland	7 75
Caledonia	5 10	Waverly Co. Youghiogh'y	7 75
Pictou	6 15	Cannelton Cannel	13 50
Block House	5 60	Cumberland	5 90@ 6 20
Red Bank Cannel	10 00	Anthracite	6 50@ 7 00
Glace Bay	5 40	" Retail	8 00
Sydney	7 25		

Burlington, Iowa.

Aug. 29, 1874.

Specially reported by Messrs. WIGHTMAN & CUMMINGS wholesale and retail dealers and shippers of coal.

Continue quotations.

Per ton of 2000 lb.

Lehigh Lump	$15 00	Illinois Smithy	$6 00
Lackawanna	11 00@11 50	" Steam	3 75
Blosburg Smithy	13 00	Connel'sville Coke	12 50
Pittsburgh "	10 00	Illinois "	10 00

Buffalo, N. Y.

Sept. 2, 1874.

Reported by our Special Correspondent.

Trade moves slowly. No change in quotations, except in Briar Hill, which shows a decline of 25 cents on lump. Other soft coals the same. Anthracite advanced 15 cents per ton on the first; quotations should be now that much higher. On steam coals we see no prospect of advance for some time. Gas coals move slowly. A new company has just been formed, with J. Magee, of Corning, at the head, for the purpose of purchasing coal lands in McKean County, Pa. Mr. Magee bought the refusal of 16,000 acres, and put men and an engineer on the land to determine whether coal was there in paying quantities or not. The result is shown by the formation of the company above, and Mr. Magee shows his faith by his works, taking over half of the stock (500,000) himself, leaving 500,000 to be taken by others. The road will be tributary to the Buffalo, New York and Pennsylvania Railroad, coming into that road at Larrabee. The lands are only 106 miles from Buffalo, and if the coal is plenty, and of good quality, it will certainly give cheap fuel for steam.

Per ton of 2000 lb.

	Slack.	Nut & Slack.	Nut.	Lump
Connelsville coke				6 50
Sterling cannel				6 00
Red Bank				5 75
Youghiogheny coal for gas				5 50
Briar Hill coal		3 25		5 00
Fairmount "		3 25	3 50	4 25
Catfish "		3 25	3 75	4 50
Stoneboro "	2 75		3 50	

Briar Hill coal, and Stirling and Red Bank cannels, at $8; all other coals $1 per ton above wholesale prices.

Anthracite f. o. b. vessel. Retail prices delivered and screened, $1 per ton additional.

Grate	6 55	Stove	7 00
Egg	6 55	Chestnut	6 50

Chicago, Ill.

Aug. 31, 1874.

Specially reported by Messrs. RENO & LITTLE, Coal Merchants.

There is to-day an advance of 25 cents a ton on all sizes of anthracite coal. No change in prices of soft or bituminous coals. Trade improving.

Retail prices per ton of 2000 lb. delivered to buyer.

		BITUMINOUS.	
Lehigh Lump	$10 75	Briar Hill and Erie	7 50@ ....
Lehigh prepared and car load lots	9 75	Walnut Hill (W. Va.)	6 50@ ....
		Midway (West Va.)	6 50@ ....
Lackawanna, Wilkes-Barre and Pittston,*		Cannel	8 00@ 9 00
		Blossburg	8 00
Grate, egg, and chest.	9 00	Indiana Block	6 00
Stove or range	9 50	Hocking "Brooks"	6 00
		Wilmington and Illinois	5 00

*75 cents off these prices for car load lots to country dealers and manufacturers.

Cleveland, O.

Sept. 1, 1874.

Reported by our Special Correspondent.

Quotations unchanged,

Per ton of 2000 lb.

Youghiogheny, l'p, f.o.b.	$4 65	Straitsville	$3 50
Youghiogheny, nut	3 60	Columbiana	3 75
Briar Hill, (Church Hill)	4 45	Strip Vein	4 00
" " (Brookfield)	4 30	Mountain Blossburg (blacksmith)	6 00
Massilon, according to quality	$3 60 to 3 85	Darlington and Sterling Cannel	4 60
Hocking Valley	3 75		

Cincinnati, O.

Sept. 1, 1874.

Specially reported by Messrs. A. BUCHANAN & Co., wholesale and retail dealers in coal and coke.

There is no change in the market here except as to Pittsburgh coal afloat, which is worth 12 cents per bushel now. Business has been better the past week than for some time, and the market quite firm.

Per ton of 2000 lb.

	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	12 c.	$2 86
Pomeroy coal	7½ c.	1 95
Cannel coal	18 c.	4 68
Semi Cannel	10 c.	2 60

The following are retail prices delivered:

Youghiogheny	15 c. $3 90@$
Pomeroy	12 c. 3 12@
Cannel	22 c. 5 72@
Kanawha Semi Cannel	14c. — 3 64
Anthracite	— 11 00
Foundry coke	12c. —
Soft coke	8c@10c. —

Council Bluffs, Iowa.

Sept. 1, 1874.

Reported by our Special Correspondent.

Prices unchanged.

Per ton of 2000 lb.

ON TRACK.

Blossburg (blacksmith)	$14 80	Wyoming	14 00
Anthracite	15 00	Missouri	6 00
Iowa	4 50	Kansas	6 00

RETAIL.

Blossburg	$16 00	Wyoming	$12 00
Anthracite	16 00	Missouri	8 00
Iowa	6 50	Kansas	8 00

Detroit, Mich.

Sept. 1, 1874.

Specially reported by Messrs. ROBINSON & KEYS, dealers in all kinds of coal.

We are this week able to report a little better tone to the market. Orders are coming in a little more freely, and stocks are held firm at quotations. Prices will probably advance in a few days enough to cover the regular monthly advances East.

Per ton of 2000 lb.

Lehigh Lump, per ton	$10 50	Blossburg	8 50
Lehigh " prep. sizes	9 50	Briar Hill	7 50
Wilkes-Barre, Grate and Egg	8 50	Willow Bank	7 00
Wilkes-Barre, Stove and Nut	9 00	Erie	7 50
		Massillon	7 00

Denver, Col.

RETAIL PRICES.

Per ton of 2000 lb.

Canon	$6 50	Boulder Valley	$4 75
Marshall	5 50	Eulner	5 50
Murphy	5 50	Black Diamond	5 50
Baker	5 00		

Erie, Pa.

Aug. 30, 1874.

Reported by our Special Correspondent.

Wholesale, per ton of 2,000 lb.

Continue former quotations.

Anthracite f.o.b. vessels.

Lump	$6 60	Stove	$6 65
Grate	6 10	Chestnut	6 05
Egg	6 10		

Bituminous f.o.b.

Briar Hill	$4 40	Beaver	$4 25

Retail, per ton of 2,000 lb.

Anthracite.

Lehigh, chestnut	$8 50@$9 00		
" prepared	8 75@ 9 25		
Lykens Valley, stove	9 50@10 00		
Lykens Valley, chestnut	8 00@ 8 50		
Schuylkill and Wilkesbarre	7 50@ 8 00		
Blossburg (Smithing)	7 50@ 8 00		

Bituminous.

Chenango Valley (Ormsby), lump	$6 00		
Mahoni ng Valley (Briar Hill), "	5 00		
Nut, all kinds	4 00		
No. 1 slack	3 06		
Bituminous, by car loads to factories	5 35		

Indianapolis, Ind.

August 31, 1874.

Specially reported by Messrs. H. MCCOY & Co.

We have no change to report in the prices of coal. There is quite a brisk demand for coal for stocking purposes, but no change in price is looked for until the 1st of October. Please continue quotations of last week.

Per ton of 2000 lb.

BITUMINOUS.

Best Block coal	$2 90	Indiana cannel	6 50
Best Highland	2 40	Hocking Valley	3 00
Block Nut	1 65	Youghiogheny	5 42
Highland "	1 65	Blossburg (smithing)	7 30
Block slack, per car load	15 00	Piedmont "	7 75
Peytona cannel per ton	8 50	Gas coke, per bushel	9¾c

ANTHRACITE (Lackawanna).

Grate	$8 55	Chestnut	8 55
Egg	8 55	Stove	8 55

Retail, per bushel of 70 lb.

Block	14c.	Peytonia Cannel	32c.
Highland	12	Indiana "	28
Highland Nut	9	Youghiogheny	25
Block "	9	Blossburg	27
Slack	7	Piedmont	30

ANTHRACITE.

	per ton.		per ton.
Grate	$10 50	Stove	$10 50
Egg	10 50	Chestnut	10 50

Louisville, Ky.

Sept. 1, 1874.

Specially reported by Messrs. BYRNE & SPEED.

Please report our coal market the same as last week.

Pittsburgh, per load of 1900 lb	$3 50
Pomeroy	3 00
Buckeye Cannel	5 50
Peytons Cannel	6 00
Nut and Slack	2 75
Kentucky lump, per load	2 75
" nut, "	2 25
" Slack "	1 30
City-made Coke, per bushel	12c
Kentucky on cars at wholesale per bush.	8½c
Anthracite, per ton	$10 to $10 50

Milwaukee, Wis.

Aug. 30, 1874.

Specially reported by Messrs. R. P. ELMORE & Co.

Prices remain the same. Trade is improving.

Retail prices per ton of 2000 lb.

Lehigh Lump	$10 00	Briar Hill, select	$8 50
Lehigh Prepared	10 50	Blossburgh	8 00
Lackawanna	9 50	Pittsburgh	7 50

New Orleans, La.

Aug. 29, 1874.

Specially reported by Messrs. P. & R. DEVERGES, Wholesale and Retail Dealers in Pittsburgh, Anthracite and Cannel coal.

Market dull with a full supply. We quote:

Pittsburgh coal, retail, per bbl	60c.
" wholesale	40c.
" per hhd	$6 00
" to steamboats, per box	50c.
" to manufacturers, per bbl	55c.
Anthracite, retail, per ton	$12 50
" wholesale per ton	$9 00@9 25
Spadra (Arkansas) coal, retail, per bbl	75c.
Mt. Carbon, wholesale, per bbl	45c.
" " retail per bbl	65c.
Scotch Cannel, per bbl	1 00

Pittsburgh, Pa.

September 1, 1874.

Reported by our Special Correspondent.

Miners representing mines on Saw Handle and Connellsville railroads, and Monongahela river, held a meeting to-day, and resolved to demand four cents for mining, but the operators seem determined not to accede to the demand. Trade continues dull. Present prices:

Twenty-five to fifty cents per ton additional for delivery.

Per ton of 2000 lb. and Bushel of 76 lb.

	per ton.		per ton
Youghiogheny coal	$2 15	Pittsburgh retail delivered per bushel	9c@10c
" coke	2 75		
Connellsville coal	2 25	Anth'cite on cars Lehigh	$7 75
" coke	3 25	" " Wilkes-Barre	6 75
Pittsburgh coal	2 00		

San Francisco.

From the *Commercial Herald*, August 20.

The imports from Australia continue of importance, the bulk of which were placed before arrival at $9 87½ or less: spot parcels command $10 and upward. The cargo of 753 tons ex *Pacific* sold at $10 37½; 1,800 tons per *British Statesman* went to the Gas Company. The market is liberally supplied with Cumberland, resulting in a sale of 100 casks ex ship at $17 50. A cargo of West Hartley to arrive has been placed at $12, and for another of same to arrive only $10 50 offered. We quote Lehigh, $16@$18; Pittston, ex ship $13@$14. The *Star of Scotia*, from Newcastle, N. S. W., only brought 350 tons for ballast trim. The *Melpomena* from same had 1805 tons. Small supplies of Seattle are now coming from the north.

St. Louis, Mo.

Aug. 29, 1874.

Specially Reported by the COLLINSVILLE COAL AND MINING COMPANY.

ANTHRACITE.

Per ton of 2000 lb.

	City delivery.
Lehigh Lump	$13 50
Lackawanna and Wilkesbarre	12 50
Semi Anthracite	9 50

BITUMINOUS.

Per ton of 2000 lb.

	E. St. Louis.	City delivery
Washington Indiana—smithing	$4 00	$4 87
O'Fallon, Ills.	2 00	3 00
Collinsville and Belleville, Ills.	1 75	2 75
Indiana Cannel	6 00	7 00
Missouri Cannel		5 00

Retail, 25c. per ton additional.

Toledo, Ohio.

August 29, 1874.

Per ton of 2000 lb.

Specially reported by Messrs. GOSLINE & BARBOUR.

Retail.		Retail.
Wilkes-Barre and Scranton, Large and Small Egg	$8 00	BITUMINOUS. Blossb'g and Cumberl'd, $8 00
Stove	8 25	Massillon Lump	6 00
Chestnut	8 00	Briar Hill	7 00
Lehigh Lump	10 00	Straitsville	3 75
		Hocking Valley	4 00

Halifax, N. S.

Aug. 30, 1874.

Reported by our Special Correspondent.

Continue quotations.

Prices per ton of 2240 lb. in gold.

Sydney (old mines)	$4 50	Little Glace Bay	3 50
Gowrie	3 50	Blockhouse	4 00
Victoria	3 75	Albion (at Railroad)	4 50

Montreal.

Aug. 30, 1874.

Reported by our Special Correspondent.

No change at this point.

Per ton of 2,240 lb.

Scotch Steam	$6 25@6 50	Cape Breton Steam	$5@5 50
Pictou "	6 00@6 25	Newcastle Smiths,	8@8 25

Anthracite at retail, 2,000 lb., delivered:

Egg	$8 00	Nut	$8 00
Stove	8 50		

Toronto, Ont.

Aug. 30, 1874.

Reported by our Special Correspondent.

The prices and terms of the Toronto Coal Exchange remain as follows:

ANTHRACITE.

	per ton.		per ton.
Broken	$7 65	Chestnut	$7 65
Egg	7 65	Lehigh	9 00
Stove	8 15		

BITUMINOUS.

Blossburgh	7 50	Screenings	5 00
Briar Hill	7 00	Soft Nut	5 50

Rates of Transportation on Anthracite Coal to Tide Points.

From Mauch Chunk to New York "towing limits," via Lehigh Valley R. R.	$2 60
From Mauch Chunk to Jersey City "for reshipment," via Lehigh Valley R. R.	2 40
* *From Phillipsburg to Hoboken* "for shipment," via Delaware, Lackawanna & Western R. R.	1 28
† *From Penn Haven to Elizabethport, Port Johnston and Hoboken*, via Central railroad of New York	2 29
‡ *From Mauch Chunk to Elizabethport, Port Johnton, Hoboken and South Amboy*, via Lehigh Valley R. R.	2 20
From Port Delaware to New York and Jersey City, via Morris Canal	1 71
From Mauch Chunk to Philadelphia via N. P. R. R.	1 75

From Schuylkill Haven to Philadelphia, via canal. Freight 65c., tolls $1 10..... 1 75
From Tumaqua to Port Richmond "for shipment," via P. & R. R. R..... 2 07
From Schuylkill Haven to New York, via canal..... 2 72

On canal coal at Jersey City an additional charge of 20 cents per ton will be made for transferring coal from boat to boat, and thirty cents per ton for placing the same on the wharves and re-shipping.

The rate on coal for way-points on the New Jersey railroads will be $1 15 per ton from Mauch Chunk to Phillipsburg.

* 52 cents additional to this rate is added on coal for consumption.

† The rate from Phillipsburg to these points is about $1 per ton less.

‡ From Penn Haven to these points it is 15 cents additional, and from Phillipsburg the rate is 89 cents less,

Freights on Bituminous Coals from the Mines to Tide-Water Shipping Ports.

From the Mines to Cumberland and State Line (say an average of 20 miles) the charge is 3 cents per ton of 2240 lb. per mile.

From State Line to Amboy, (346 miles) $4 00 per ton of 2000 lb. On coal shipped beyond that point there is a drawback of 50 cents per net ton.

From Cumberland to Baltimore, (178 miles) $2 58 per ton of 2240 lb., or $2 30 per net ton, and 4 cents per gross ton for use of cars.

From Cumberland to Georgetown, (152 miles) by canal, $1 76 per ton of 2240 lb. *To Alexandria, Va.*, 11 cents per ton more.

From the Mines to Piedmont, (from 4 to 10 miles) 5 cents per ton of 2240 lb. per mile on distances less than 5 miles, and 4 cents per ton per mile on distances not over 10 miles.

From Piedmont to Baltimore, (206 miles) $2 97 per ton of 2240 lb., or $2 65 on net ton.

From any point in the Kanawha Valley to the James River wharves below Richmond (say 350 miles) by C. and O. R. R., including terminal charges, per ton of 2000 lb., for Cannel coal, $5 35. Subject to rebate on large quantities.

Do., do., for Semi Cannel or Splint, $3 65.

From Hawks Nest to Richmond (say 300 miles) the freight on Bituminous or Splint is $3 25 per ton of 2000 lb; on Cannelite it is $5 00.

From Irwin to W. Phila. (say 332 miles) per P. R. R. Penn. Westmoreland gas coal, per ton of 2000 lb.....$5 00
From Osceola to W. Phila. (say 248 miles) per T. & C. R.R. bituminous coal of 2000 lb..... 3 55
From Fairmount and Clarkesburg to Baltimore (say 300 miles) via B. & O. R. R. including loading, per 2000 lb..... 5 20
On through coal after deducting drawback..... 4 15
From Richmond, Va., to New York, 392 miles per 2000 lb. 2 10
" " " Boston about 650 " ".... 3 00
" " " Philadelphia 292 miles ".... 1 75
From the Mines to Richmond via James River and Kanawha Canal, 15 miles..... 52

Freights.

The demand for vessels does not, as yet, seem to increase in proportion to the supply, the quotations in our last will very nearly indicate the prevailing rates. The rate to Boston continues at $120, we hear, however, of a schooner of between 400 and 500 tons being taken at $1 15. Several charters to Boston from Philadelphia have been effected at from $1 35 to $1 40. These exceptions to what are termed the "prevailing rates" are so frequent that we would come as near to finding the cost of coal transportation by consulting the "exceptions" as we would did we examine the official figures. This unsettled feeling is due principally to the anxiety of owners of vessels to effect charters which there is not a demand for, it is becoming quite frequent for shipments to show a loss to skippers. Seamen's wages have been reduced one third in consequence of the demoralization in freights, crews now shipping at $20 per month.

OFFICE OF THE PA. AND N. Y. R. R. Co.
Bethlehem, September 1st, 1874.

On and after this date, rate on Coal to Buffalo, Rochester and points west of Salamanca on the Atlantic and Great Western or Erie Railways; Watkins, for shipment, on Northern Central Railway; Ithaca, for shipment, on Ithaca and Athens RR.'; Auburn, for New York Central RR.; Weedsport, for Erie Canal; Sterling, for Lake Ontario Shore RR.; and Fair Haven, on Southern Central RR.; will be advanced on this Road 4 cts per ton.

Coal Freights from the Anthracite Mines to the Principal Markets.

We refer to our issue of July 11th any one desirous of consulting the above.

Towing.

The above remains unchanged as compared with our last issue, to which refer.

REVIEW OF THE BRITISH COAL AND IRON TRADES.

Compiled from our Exchanges to date, August 21st, 1874.

London.—The receipts of coal at the Port of London, to the 1st of August, were:

By Rail..... 2,891 320 tons.
" Sea..... 1,518,523 "
" Canal..... 3,605 "
Total..... 4,413,448 tons,

being a decrease of about 300,000 tons, as compared with the same period last year.

There has been a good demand for house coals during the week under review, and prices advanced 6d. to 1/ per ton; they now vary from 22/ to 25/, according to quality. Hilton and Hartlepool standing at the head of the list at 25/.

North of England and Cleveland.—The English workmen are great patrons of sport, and the occurrence of a horse race generally stops work at most of the mines and works in the district. The Stockton races caused a complete suspension of work at the mills and forges in the Tees district, so that there was little done during the week. There is a good demand for foundry iron, at 70/@72/ 6d., for No. 3. The production of the higher numbers is restricted by the irregularity in the working of the furnaces, caused by the change in the ores used, occasioned by the late strike among the Cleveland ironstone miners. Forge irons are a little easier, at 56/@57/, four months. The impression is gaining that there will be further reductions in the prices of iron before long, the coal masters having made a further demand for reduction in wages, to the extent of 20 per cent., from the 1st of October. This would still leave the men 20 per cent. higher wages than they obtained previous to the great increase of a few years ago.

There is a good demand for steam and gas coal, and although there is less inquiry for house qualities, the demand is sufficient to keep the pits at work. The demand for pig iron is stronger, and makers are looking for higher prices. Manufactured iron is quiet. The plate mills are kept pretty well employed, and prices are firm. There is a fair demand for shipbuilding iron.

The iron trade of *Yorkshire* is reported somewhat more quiet than it has been, and the festivities, which are celebrated at this season, have considerably interfered with work. The coal trade remains without substantial change.

Although there is a general complaint of quietness in the *Lancashire* coal trade, the principal proprietors are tolerably well supplied with orders, and for the better qualities of coal the demand is said to be equal to the get. In the iron market there has been a rather easier feeling during the past week so far as regards the demand for foundry pig, and at the Manchester market on Tuesday, prices were about half-a-crown lower than a week previously. The improvement in forge iron has not been maintained. In manufactured iron a firm tone prevails, and rates are likely to rule higher for the next few weeks. Most of the rolling mills are fully engaged, and the engineers and ironfounders are reported busy.

Though far from active, the condition of the *South Staffordshire* iron trade is decidedly better than at the opening of the quarter. The demand for sheets and plates is especially good, and mills devoted to the production of this class of iron, after several months' idleness, are now once more in steady operation. For nail-making iron and tube strip, orders also are comparatively numerous. There is little business doing for export, except in the department of galvanized sheets, which are in request chiefly for colonial markets, and merchants are still holding out for a reduction. Quotations at present are on the basis of £12 for marked bars, and £10 to £11 for unmarked iron—sheets being quoted £13, and hoops £11 10/. Although many mills and forges continue closed, the number in active operation is increasing from week to week, and two additional furnaces, making 52 out of 153 erected, have been re-lighted within the last few days. The demand for pig iron, however, is restricted by the competition of pig makers in the North of England and South Wales districts. Coal is nominally unchanged; but though the associated masters are unyielding, some of the smaller unassociated coal owners announce reductions of from 1/ to 2/ per ton on quarter-day prices.

The coal trade of *South Wales* continues steady, with a tendency to increased activity. Prices, however, are lower than they were Although there is little actual increase in operations, iron-masters evince more confidence, and advices are more encouraging.

All restriction as to the number of blast furnaces to be used by the Scotch iron-masters is now removed, with the result that about two-thirds of the whole number in the country are blowing. The smallness of the pig reserve in the general stores, and the very inconsiderable stocks in the hands of makers, lead to the inference that the revival in the demand will bring a much-needed season of activity. Larkhall now presents the only vestige of resistance in the west on the part of the miners to the employers' terms, and the struggle even there is confined within very narrow limits. The iron trade shows signs of unmistakable improvement.

IRON MARKET REVIEW.

New York.

Sept. 3, 1874.

Many of the remarks which we have made in connection with the coal trade will apply equally to the iron trade. While we would gladly believe the reports of better trade which we see quoted in some of our trade exchanges, we cannot find any confirmation of them in this market. There is no improvement here, and we are still obliged to report heavy iron as dull and drooping. When, a month ago, we could find no ground for the glowing reports of reviving trade and approaching higher prices, we were accused of "bearing;" the condition of the market, week after week, and to-day, has fully confirmed the accuracy of our reports. We see no probability of higher prices in pig iron in this market for some time to come. The tendency is constantly towards lower figures, and yet the demand increases but little. Consumers purchase only for immediate use, and there is no one who would invest in pig iron on speculation at present prices.

Our iron-masters must set to work seriously to reduce the cost of making iron, and, beginning at the bottom, go through the list of items which go to make up the grand total, and they may as well make up their minds to smaller margins for profit on the reduced cost than they have been accustomed to for the last few years.

The Marquette *Mining Journal*, of the 29th ult., gives the state of the Lake Superior iron trade as follows:

"Like a good many others, we have been for some time 'whistling to keep up our courage.' We have seized with avidity upon everything in our Eastern exchanges which betokened a change in the iron market, and have tried hard to reason ourself and readers into the belief that prices had at last touched bottom, and any change must necessarily be for the better. We regret to say, however, that the market for charcoal iron is now weaker than it has been at any time since the panic, and that there is very little of hope or encouragement in the outlook. We are reliably informed that there is at this time not less than 50,000 tons of charcoal metal unsold in Cleveland, and that stocks still continue to accumulate all over the country. The quotations given us from Cleveland are for small lots, and cannot be taken as a true indication of the state of the market. We know of one party who offered 4000 tons of charcoal iron at $31 in the Chicago market without finding a purchaser, the highest price offered being $28. This, taken in connection with the fact that Lake Superior charcoal iron cannot be laid down in the Chicago or Cleveland markets for less than $35 per ton, is significant of anything rather than an improved feeling in iron circles."

American Pig.—There have been but few transactions worthy of note. The usual quantity of Thomas Company's Lehigh has been disposed of at $29@$31. We note the forced sale of 1,000 tons hypothecated Hudson iron, which, we are informed, was bought by the makers at $25@$27, net cash, for 2 X and No. 1. We also note sale of 100 tons No. 1 and No. 2 Hudson, sold at $27@$29. Other sales are reported on private terms, and are consequently of little interest. We quote: No. 1 at $30@$31; No. 2, $27@$29; gray forge, $25@$28.

Scotch Pig.—There is very little demand for this iron, and the small stock of only a few hundred tons may last for several weeks. We note sale of 100 tons Glengarnock at $36 50@$37. We quote: Glengarnock, $37, and one lot of rejected iron of this brand offered at $34; Eglinton, $33@35. There is none coming out. The latest cable telegrams furnished us quote Eglinton at 86/, and Gartsherrie at 110/, f.o.b. at Glasgow. Mail advices to the 21st August state that there were at that date 109 furnaces in blast in Scotland, and the stock of iron on hand was 21,497 tons, less than half the stock at same date last year. Warrants were quoted 86/@84/, prompt cash.

Rails.—There is a rumored sale of 5,000 tons Scranton rails to go to Chicago on private terms; also, a reported sale of 4,000 tons Troy and Cambria steel rails to Delaware & Hudson Canal Company. We quote: Iron rails, $55 at the works; Foreign, $48@50 gold, in New York,

Old Rails.—We note a sale of 75 tons double heads at $37, and have reports of sales of Ts at $34. We are informed that some 2,500 tons have been sold in Chicago at $28. We quote here $34@35.

Scrap.—We note the sale of 500 tons scrap for delivery in October at $35. We quote $34@$35.

Boston.

Aug. 29, 1874.

From the *Commercial Bulletin*.

Pig has had a quiet week. The five and ten ton lots, such as has been the run of this month on, just now seem not to be wanted. There is no Coltness, Gartsherrie, or Summerlee in this market, nor any encouragement to import.

Bar is moving in a small or trivial way, just enough to suggest a breath in trade. The telegraphic news in Thursday's dailies that the manufacturers of merchant iron held a meeting in Pittsburgh, Pa., Wednesday, and advanced the prices about six dollars per ton, had no effect on prices here. Dealers remember how the spring's advance at the West to $67 was neutralized by the circulars of a North street house offering single bar or ton orders at $65. The advance is nearly 3-10cc. on a pound; but previously manufactured iron was selling at 1-10c. under the Pittsburgh market, making the value here within one mill of being ½c. below the producing point.

We quote yard lots of American Pig Iron at $36@$39 per ton, including No. 2 extra at $34@$36, and No. 1 at $38. We quote Eglinton at $38. Coltness Gartsherrie at $45@$46, Charcoal at $54@$55.

American and English refined bar iron is selling at $67 50 &$70 per ton for the ordinary sizes, and $85@$90 for extra sizes, according to size. Cast steel is selling at 17½c. gold, for English. 15@16c. for American currency. Anchors are selling at 8c. per pound; chain cables (⅝@2 inches thick). 5¼@7c. per lb.; coil chains, from 3-16 to 1¼ inches, 7@15c. We quote boiler plates at 6@6¼c. for flanges, 4@4½c. for C. No. 1, and 3¾@4¼c. per lb. for common and tank. Russia sheet is selling at 16½c. gold and 18c. currency, for perfect lots English and American sheet are selling at 5@7c. per lb. currency. We quote galvanized sheet iron, No. 20, at 9½c.; Nos. 21 to 24 10½c.; 25 and 26, 11½c.; 27, 13c.; 28. 13½c. Nails are selling at $4 for 10d to 60d, and other sizes at a range of $4@$8 per 100 lb. net. Horse nails, 28c. for No. 7.

Chicago

Sept. 1, 1874.

Specially reported by Messrs. ROGERS & Co., dealers in Scotch and American pig iron.

Continue quotions.

No. 1 Coltness	$46 00@	....
No. 1 Gartsherrie	45 00@	....
No. 1 Summerlee	44 00@	....
No. 1 Glengarnock	42 00@	....
No. 1 Eglinton	40 00@	....
Warner's "American Scotch"	41 00@	....
Massilon No. 1 Foundry	37 00@	....
No. 1 Grand Tower Mo. ores (Bituminous)	35 00@	....
No. 2, " " "	32 00@	....
No. 1 Mill	31 00@	....
Union "A" 1 (Anthracite)	34 00@	....
Union "B" 1 (Anthracite)	32 00@	....
No. 1 Lake Superior (charcoal)	36 00@	....
No. 2 Lake Superior "	34 00@	....
No. 3 Lake Superior "	30 00@	....
No. 4 Lake Superior "	42 00@	....
Bessemer Steel Rails	90 00@	95 00
New Iron Rails	53 00@	....
Old Rails	33 00@	....

Cleveland

Sept. 1, 1874.

Specially reported by Messrs. C. E. BINGHAM & Co., dealers in pig iron and iron ore.

Market firm, at prices below, on 4 months time. Discount for cash, 3 per cent.

No. 1, Anthracite Foundry	$35 00@	....
No. 2, " "	34 00@	....
No. 1, Bituminous "	33 00@	....
No. 2, " "	31 00@	....
No. 1, " Grey Forge	29 00@	....
No. 1, Massilon Black Band	36 00@	....
No. B-1 " "	34 00@	....
No. 2 " "	32 00@	....
No. 1, Lake Superior Charcoal	36 50@	....
No. 2, " "	35 00@	....
No. 3, " "	38 00@	....
No 4, " "	39 00@	....
Nos. 5 and 6 "	40 00@	....
American Scotch, No. 1, Cherry Valley	35 50@	....
" " No. 2	33 00@	....

Cincinnati.

Sept. 1, 1874.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

The recent advance in the price of manufactured iron has had a good effect upon forge pig, which is now held with greater firmness. Beyond this we have nothing of special interest to note. We quote:

CHARCOAL.

Hanging Rock, No. 1, Foundry	$33 00@	34 00	—4 mos
" No. 2, "	31 00@	32 00	—4 mos
" Mill	29 00@	30 00	—4 mos
Tennessee No 1, Foundry	31 00@	32 00	—4 mos
Tennessee. No. 2 "	30 00@	31 00	—4 mos
" Mill	28 00@	29 00	—4 mos
Missouri, No. 1, Foundry	34 00@	35 00	—4 mos

STONE COAL.

Ohio No. 1, Foundry	31 00@	32 00	—4 mos
" No. 2, "	29 00@	30 00	—4 mos
Ohio Mill	28 00@	29 00	—4 mos
Missouri, No. 1, Foundry	31 00@	32 00	—4 mos
" No. 2, "	30 00@	31 00	—4 mos
" Mill	28 00@	29 00	—4 mos

CAR-WHEEL.

Hanging Rock, C. B	50 00@	55 00	—4 mos
Tennessee "	45 00@	48 00	—4 mos
Missouri "	45 00@	48 00	—4 mos
Alabama "	45 00@	48 00	—4 mos

BLOOMS.

Charcoal	85 00@	95 00—cash

SCRAP IRON.

Cast	80@	90—cash
Wrought	1 25@	1 50—cash

Indianapolis, Ind.

Aug. 31, 1874.

Specially reported by NELSON KINGMAN, broker and dealer in pig iron, etc.

The pig iron market in unchanged. Sales confined to small lots for immediate use.

Present quotations are as follows:

New Rails at mill	$62 00@	64 00	
Old Rails "	30 00@	31 00	
Hanging Rock Charcoal Pig No. 1 foundry	35 00@	36 00	—4 mos
" " " " 2 "	32 00@	33 00	—4 mos
" " " " Mill	29 00@	31 00	—4 mos

STONE COAL.

Indiana No. 1 Foundry pig Planet furn'e.	32 00@	34 00	—4 mos
" 2 " " "	31 00@	32 00	—4 mos
" 1 Forge " "	29 00@	....	—4 mos
" 2 " " "	27 00@	....	—4 mos
Ohio No. 1 Foundry pig	33 00@	34 00	—4 mos
" 2 "	31 00@	32 00	—4 mos
" 1 mill	28 00@	30 00	—4 mos
Merchant Bar, card rates	60 00@	62 00	—3 mos
1st quality C. H. No. 1 Boiler Plates, per lb	5¾@6	c.	—3 mos
1st " Com Sheet, for No. 24, W.G. "	5	c.	—3 mos
1st " Charcoal Sheet " " "	6	c.	—3 mos
Best Bloom Galvanized Sheet, discount 20 per cent			—cash.
2d quality " " " 30 "			—cash.

f. o. b in Indianapolis.

Louisville.

Sept. 1, 1874.

Specially reported by GEORGE H. HULL, Esq.

Hot blast Irons continue firm in price, with a moderate demand. Cold blast irons are dull, with small sales.

The usual time, 4 months, is allowed on the quotations below.

HOT BLAST—CHARCOAL.

No. 1 foundry, from Hanging Rock ores	$33 00@	34 00	
No. 2 " " "	29 00@	30 00	
No. 1, forge, " "	27 00@	28 00	
No. 1, foundry, " Tennessee "	32 00@	33 00	
No. 2 " " "	28 00@	29 00	
No. 1, forge, " "	26 00@	28 00	
No. 1, foundry, " Alabama "	30 00@	32 00	
No. 1 " " Iron Mountain "	32 00@	34 00	

HOT BLAST—STONECOAL.

No. 1, foundry, from Missouri ores	33 00@	34 00	
No. 2, " " "	30 00@	31 00	
No. 1, forge " "	29 00@	30 00	

COLD BLAST—CHARCOAL.

Car Wheel from Hanging Rock ores	50 00@	54 00	
" " Tennessee "	46 00@	48 00	
" " Alabama "	48 00@	50 00	
" " Georgia "	48 00@	50 00	
" " Missouri "	45 00@	48 00	
" " Kentucky "	48 00@	50 00	

Milwaukee, Wis.

August 30, 1874.

Specially reported by Messrs. R. P. ELMORE & Co.

Prices firm at the following quotations:

Per ton of 2,240 lb.

Scotch ranges	$40 00	to	$45 00
No. 1, Lake Superior Charcoal	36 00	to	38 00
" 2, " "	34 00	to	36 00
" 1, " " Anthracite	35 00	to	36 00
" 2, " "	33 00		

Philadelphia, Pa.

September 3, 1874.

Reported by our special correspondent.

In the Iron trade in this City or State there are no new features; dullness and stagnation continue. Prices remain nominally the same as last quoted, with all the real transactions made on "private terms," which really means lower prices. The truth is, that the anxiety to sell, and the necessities which prompt the anxiety, are such, that it would be difficult to say at what price a sale of pig iron would be made. There is a moderate trade doing in bar iron and pig iron for foundries, at low prices, but in the aggregate it does not amount to much, when we consider the large supply of raw material. The revival in the iron trade, so much spoken of a few weeks since, has not been realized, and it is not probable that it will be before next spring. All trade is a disappointment this fall to the over sanguine. The iron trade is not an exception.

Pittsburgh, Pa.

September 1, 1874.

Specially reported by A. H. CHILDS, Esq., commission merchant for the sale of pig iron, blooms, ore, &c.:

During the past week there has been rather more activity in pig iron, mainly on a basis of $26 50—4 mos., for gray forge. There were some sales at $27 00, but this figure could be obtained only for very choice brands, or for future deliveries.

Quotations are:

No. 1 Foundry, anthracite or bituminous	$29 00@	30 00	—4 mos
No. 2 " "	27 50@	28 00	—4 mos
Gray forge "	26 00@	27 00	—4 mos
White and mottled "	24 00@	25 00	—4 mos

The following is from the *Commercial* of Aug 30:

From reports below it will be seen that the sales of pig metal the past week are considerably in excess of any week for some time—which may be accounted for in several ways. The extreme dullness which has prevailed for several weeks has had the effect to induce parties to accept orders at a shade off former rates, which, added to the fact that most of the rolling mills expect to start double turn next week or week after, has produced a little more demand.

The Convention of Manufacturers which met in this city on Wednesday, and brought together representatives from more than forty establishments, may have had some effect to increase the sales, especially as it was generally conceded that the prices at which sales of manufactured iron and nails have been made for several months past, were below the cost of production and that some combined effort must be made to secure more satisfactory prices.

At this convention it was resolved to advance the actual selling price of iron without making any material alteration in the card price, and the convention adjourned to meet in a few weeks.

It is expected that this meeting will have the effect to make the market firmer, but it is not at all certain; therefore the mill owners are slow to buy pig iron, as they claim that even at 2.8 10c. net for bars they cannot afford to pay more than $26 50 for pig.

We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORES.

700 tons gray forge	$26 50	—4 mos
500 " " "	26 50	—4 mos
500 " " "	26 50	—4 mos
300 " " "	26 50	—4 mos
250 " " "	26 50	—4 mos
250 " " "	26 50	—4 mos
250 " white and mottled	25 00	—4 mos
200 " gray forge	26 50	—4 mos
150 " cold short, Western	25 00	—4 mos
100 " gray forge	26 50	—4 mos
100 " " "	26 50	—4 mos
100 " " "	27 00	—4 mos
100 " " "	27 00	—4 mos
100 " white and mottled	24 50	—4 mos
100 " No. 2 foundry	27 00	—4 mos
50 " gray forge	27 00	—5 mos
50 " mill	27 00	—4 mos
40 " gray forge	27 00	—4 mos
20 " cold short, Eastern	27 00	—4 mos
10 " No. 1 foundry	29 50	—4 mos

ANTHRACITE.

100 tons gray forge	$27 00	—4 mos
100 " " "	27 00	—5 mos
20 " No. 2 red short, at furnace	27 00	—cash.

CONNELLSVILLE COKE.

20 tons No. 1 foundry	$30 00	—4 mos
10 " No. 2 foundry	28 00	—4 mos
10 " No. 1 foundry	29 00	—4 mos
10 " No 2 foundry	27 50	—4 mos

CHARCOAL, HANGING ROCK.

60 tons No. 1 foundry	$36 00@37 00	—4 mos
30 " No. 1 foundry	36 00	—4 mos

METALS.

NEW YORK, Sept. 4, 1874.

Gold Coin.—During the week past, gold has ranged from 110 to 109¾ and closed yesterday at 109¾.

Bullion.—Fine silver bar is quoted at $1 27@$1 28, gold, per ounce, and fine gold bar at par ($20 67, gold, per ounce.)

Copper.—The combination appears to gain strength and the price of copper has been advanced to 21¾c., and we understand that 21¾ has been offered and refused, though some large sales are reported in the early part of the week at 21. The mining companies have withdrawn from the market and are not offering any for sale. The prospect is that prices will still further advance, since the combination appears to have the strength. Prices have advanced in Europe, and Chili bars are quoted, by Cable, £78 10/. Large sales are reported during the week, but there has been so much of this done lately, for effect, that it is somewhat difficult to obtain a fair appreciation of the condition and prospects. We quote sales of about 160,000 lb. Baltimore at 20@21 cents. The following interesting statement has been furnished us by Mr. EDWARD A. CASWELL, Metal Broker, Burling Slip. It is, we believe, the most correct statement of the copper supply that has yet been made public.

Statement of past and prospective Receipts, Exports and Consumption of Ingot Copper from January 1, 1874, to June 1, 1875, inclusive:

	Casks.	Cakes.	Pounds.
Lake Copper, rec'd from January 1 to Aug. 15, 1874	10,110	14,149	16,347,095
Baltimore Copper rec'd from Jan. 1 to Aug. 15 1874	190	2,770	619,350
Tennessee Copper rec'd from Jan. 1 to Aug. 15, 1874	288	193	433,115
	10,588	17,112	17,399,560
Stock on hand in New York and Boston, Jan. 1, 1874			10,000,000
			27,399,560

To come into market from date to opening of navigation, June, 1875:

Lake	15,000,000	
Baltimore	1,500,000	
Tennessee, etc	1,800,000	18,300,000
		45,699,560
Already shipped to Europe	3,000,000	
Sold (to be shipped)	4,000,000	7,000,000
		38,699,560

Assuming the average monthly consumption as below, we obtain the following results:

Consumption per mo. from Jan. 1, 1874 to June 1, 1875,

1,500,000 lb.	=	" 27,000,000	leav. on hand June 1, '75,	11,700,000	
2,000,000 "	=	" 36,000,000	" " " " "	2,700,000	
2,225,000 "	=	" 40,500,000	" " " " "	1,800,000	

Lead.—The feature of the lead market is the advance in price of Government to $5 75 gold. The Government sales have amounted to about 1000 tons, and it is proposed to bring 6000 tons of the lead now in Troy down to New York. The stock of Government here is about 2000 tons. There is a fair demand, and we may quote dealers' prices at $5 80@5 85. In London, English pig is quoted £21@£21 5/; Spanish soft, £20 10/@£20 15/.

Tin.—There have been some sales, and we quote: Straits, 22¼; English refined, 21½; L. and F. 20¾, all gold. Messrs. VIVIAN, YOUNGER & BOND report as follows, London, Aug. 21: "About 75 tons of Straits and 50 tons of Australian have changed hands during the week at £94@£94 10/ for the former, and £92@£92 10/ for the latter, cash terms. For arrival, some sales of Straits at £94 were made; but at the close £93 10/, cash, was accepted, and the market is dull. On the 18th inst., about 30 tons Australian ore were sold by tender at £54 10/ for fine quality."

Tin Plates.—Have been in fair demand during the week. We quote, I. C. Charcoal at $10@$10 50, gold. In London, the demand for small orders continues, but large quantities could only be sold at a reduction on present prices, which are 37/ and 36/ for charcoal I. C.

Spelter.—May be quoted dull at 6¾c.@7c. for domestic. Foreign, sch. ver., 6 60; C. G. H., 6¾; W. H., 6¾, all gold. This indicates an advance in Europe. Cable telegrams state the price there has been advanced ¼c., gold, for good selections.

Zinc.—The market is inactive. Prices may be quoted for sheets at 8c@8½c., gold.

Antimony.—Light demand and prices unchanged at 11¼@11¾c. gold.

Manganese.—There is a brisk demand for all kinds. We quote crystallized manganese, for electro-magnetic purposes, 10c.; Saxon Peroxide, 7c.; Ga. Manganite, hard, 3c.; Ga. Manganite, soft, 4¼c.; Va. Psilomelane, 3c.

Quicksilver.—In the English market the price is £23 per flask. In the New York market the demand is fully up to the supply, and the price is $1 60 per lb. In San Francisco $1 45 per lb.

San Francisco Stock Market.

BY TELEGRAPH.

NEW YORK, September 3, 1874.

Our advices from the San Francisco Stock Board are dated the 2nd inst. The market is irregular with the tendency downward. The Yellow Jacket Mining Company have levied an assessment of $5 per share, delinquent the 15th inst. An assessment of 50 cents per share has also been levied by the Empire Mill and Mining Company, delinquent on the 17th inst. The report is as follows:

Savage	59	Imperial	7⅜
Crown Point	69	Raymond & Ely	11⅛
Yellow Jacket	76	Meadow Valley	6
Kentuck	15	Eureka V. G. Bid	—
Chollar Potosi	56	Ophir	—
Gould & Curry	22	Hale & Norcross	—
Belcher	70		

Boston Stock Market.

BOSTON, September 3, 1874.

We give below the prices bid for copper stocks at the opening of the Boston Stock Board. Excepting a decline of $1 per share in Central the list has advanced. The sales on the 2nd inst were as follows: 200 shares of Allouez at from 10 to 10⅝, 100 shares of Calumet & Hecla at $130, 115 shares of Quincy at $33, 10 shares of Copper Falls at $13, and 100 shares of Ridge at an average of $5 50 per share.

Allouez	10⅜	Pewabic	—
Calumet and Hecla Co.	130	Phœnix	14
Copper Falls	12	Quincy	33
Central	24	Ridge	5
Franklin	3¼	Rockland	—

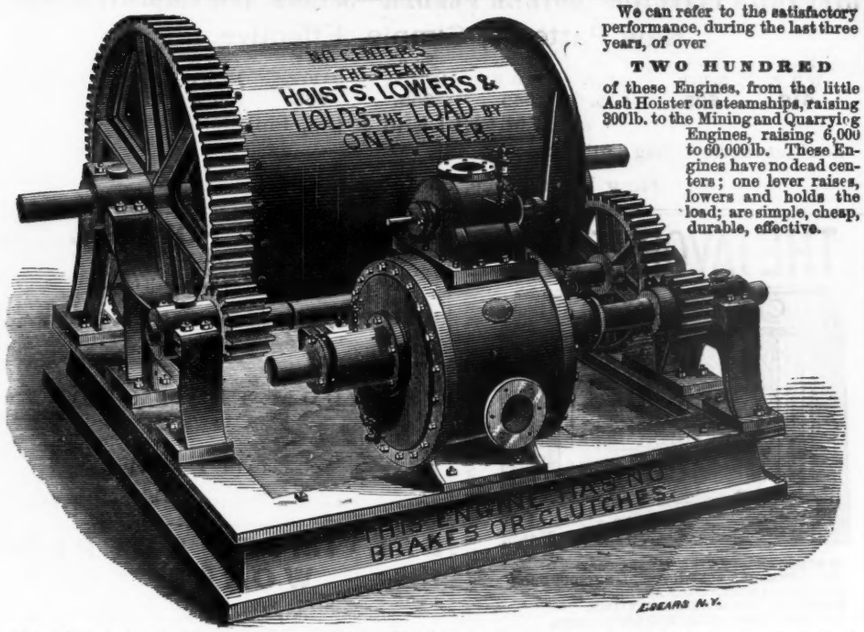
New York.

September 4, 1875.

We have not any changes to note in the following list as compared with our last, the markets are firm and steady with an upward tendency. The following represents the number of shares of the various securities sold at the New York Stock Exchange between the ranges of our quotations, New Jersey Central R. R. 750 shares, Quicksilver Mining Company 500 shares, D. L. & W. R. R. 415 shares, Delaware and Hudson Canal 100 shares, Consolidation Coal Company 100 shares. The American Coal Company announces a semi-annual dividend of 3 per cent., payable on the 10th inst.

	Bid.	Asked.
New Jersey Central R. R. Co	103	103⅛
American Coal Co	60	—
Maryland Coal Co	19	—
Pennsylvania Coal Co	240	250
Quicksilver Mining Co	31⅛	31⅜
Spring Mt. Coal Co	67⅛	72
Reading R. R. Co.	55⅛	55¼
Delaware and Hudson Canal Co	114⅜	114⅞
Lehigh Coal and Navigation Co	45¼	45⅜
Lehigh Valley R. R. Co	61	61¼
Catawissa Preferred	43	43¾
Delaware, Lackawana and West. R.R.Co.	108	108¼
Consolidated Coal Co	—	47
Little Schuylkill R. R	47	48
Huntington & Broad Top R. R. prefrd.	12	13
St. Louis & Iron Mountain	15	—
Morris Canal Preferred	119⅜	122¼
Susquehanna Canal	6	9

ROTARY REVERSIBLE HOISTING ENGINES.



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OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. The ENGINEERING AND MINING JOURNAL, which is the Organ of the Institute, and contains its proceedings, transactions and notices of meetings, will be sent to each Member and Associate on the payment of his annual dues. Back numbers cannot, as a rule, be sent.

II. Dues (ten dollars per annum) are payable on election and at the annual (May) meeting. Members and associates elected at the February meeting pay ten dollars only to May of the following year. Remittances should be made, as far as possible, by P. O. Order, payable to the Secretary.

III. The Council earnestly requests members to forward to the Secretary, for preservation, copies of all printed mining and geological reports, particularly pamphlets, which may fall in their way. It is believed that by this means a large amount of valuable fugitive information concerning different regions and properties in this country, may be caught and preserved.

THOMAS M. DROWN, Secretary, Lafayette College, Easton.

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MISCELLANEOUS.

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PHILADELPHIA, PA,

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CENTENNIAL ANNIVERSARY

of American Independence, there will be held in FAIRMOUNT PARK, Philadelphia, in the year 1876, an

INTERNATIONAL EXHIBITION

Arts, Manufactures, and Products of the Soil and Mine.

The Exhibition will be opened on the 19th of April and closed on the 19th of October.

APPLICATIONS FOR SPACE.

To secure space for exhibits in the Buildings or the Park, early application should be made. The necessary forms for application, together with the Regulations for Exhibitors and needed information, will be forwarded on application to the Office of the Centennial Commission.

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J. L. CAMPBELL,
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Nov. 21:1y

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Analysis of Average New Bed Pure Ore.

Metallic iron	68. 24
Oxygen with the iron	26. 01
Water	. 38
Insoluble Siliceous matter	4. 32
Sulphur practically	none.
Phosphorus	.038
Alumina	.28
Lime	.14
Undetermined matter and loss	.592
	100.000

Analysis of No. 1 Bessemer Pig.

Undetermined matter and loss	.134
Silicon	1.019
Carbon	3.821
Phosphorus	.048
Sulphur practically	none.
Calcium	.140
Metallic iron	94.838
	100.000

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TO INVENTORS AND MANUFACTURERS

The Managers of the 43d Exhibition of the American Institute, of the City of New York, beg to announce, that the Exhibition Buildings on 2d and 3d Avenues and 63d and 64th Streets, will be open for the reception of heavy Machinery August 17th and for other articles, August 31st, 1874. The Exhibition will be formally opened September 9th.

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MISCELLANEOUS.

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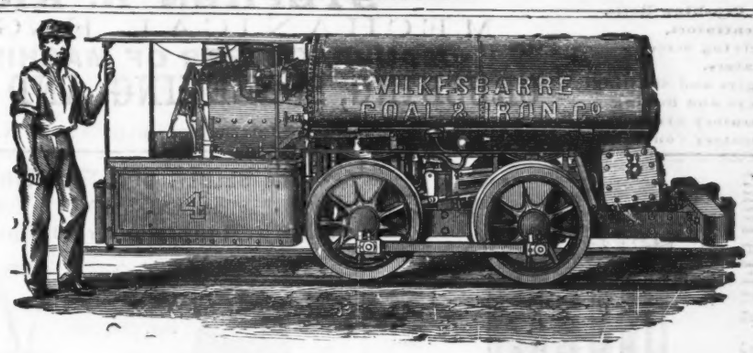

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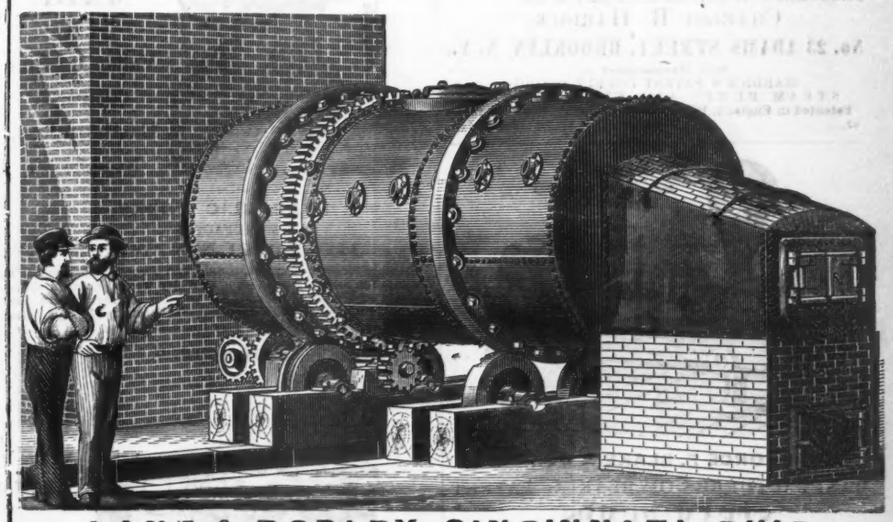

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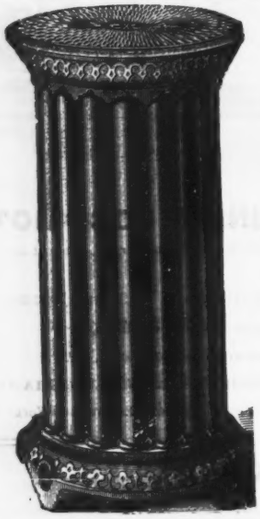

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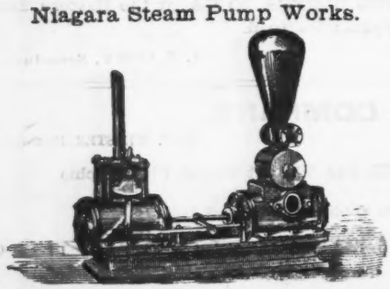

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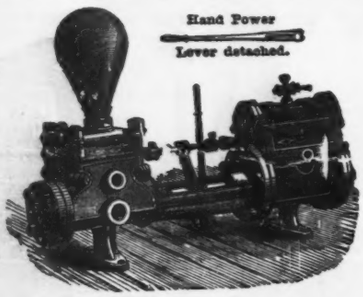

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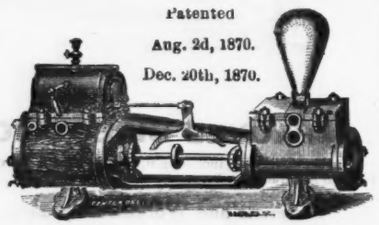

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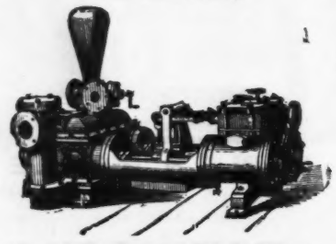

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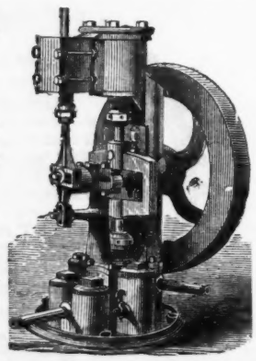

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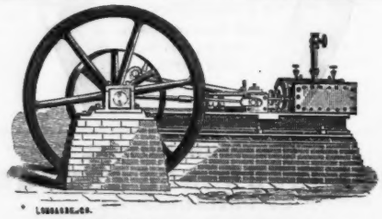

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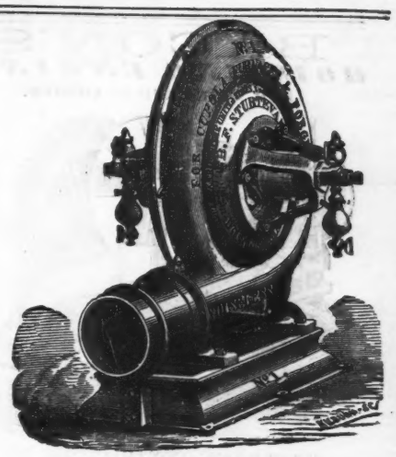

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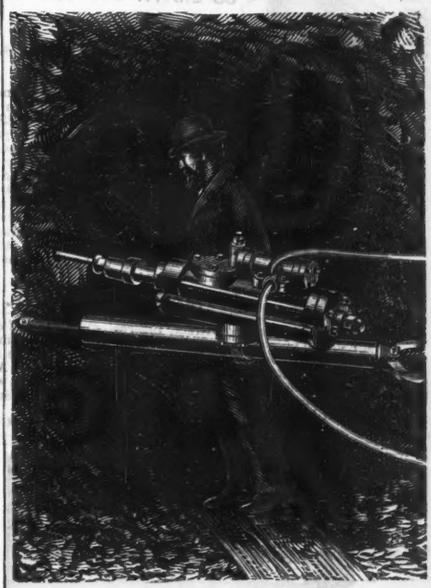

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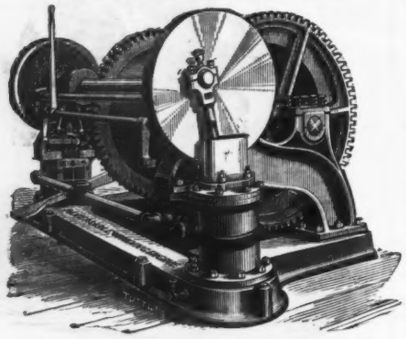

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GEO. H. REYNOLDS, in his report of the trial of the Rand, Ingersoll and Waring Rock Drills, at the Port Henry Iron Ore Company's Mines, at Mineville, N. Y., April 20, 1874, states that one hole was drilled by the Waring Drill that could not be reached by either of the other machines, and undoubtedly the mounting of this drill for all purposes of varying work is far superior to either of the others. The experiment is conclusive and satisfactory. Also Dealers in

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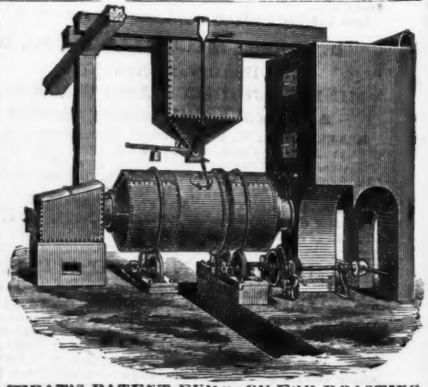

TEAT'S PATENT FURNACE FOR ROASTING, Desulphurizing, Chloridizing and Oxidizing Ores, etc.—For the reduction of Gold, Silver, Lead, and other ores, saving a larger percentage, at less cost, than any other invention now in use. Chloridizing Silver ore more thoroughly, in less time, with less fuel, salt and labor; also, roasting Lead ore preparatory to smelting, better and cheaper than any other invention. The Furnace is so constructed that one man, of ordinary ability, tends five or more furnaces; controls them with ease; adding heat and air; stopping or starting at will; charging and discharging with ease. Also, Patent "Conveying Cooler," for conveying and cooling roasted ores, heating the water for amalgamation and the boilers at the same time. Saving the large space in mill (covered with brick or iron), and the labor of two men per day, exposed to the poisonous chlorine gases. Also, Patent Air Blast "Dry Kiln," for drying ores direct from the mine or breaker, saving fuel and labor heretofore necessary in drying ores for dry pulverizing. For description refer to ENGINEERING AND MINING JOURNAL, No. 9, August 29, 1874. For particulars address TEATS & BREED, No. 12 West 8th street, Cincinnati, Ohio.
Circulars, &c., will be furnished, if required.

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